3.0 TRANSPORTATION

This chapter describes the existing transportation services and facilities within the study area for the proposed LYNX Blue Line Extension Northeast Corridor Light Rail Project (LYNX BLE), outlines the programmed and planned improvements, and assesses future travel growth and its impact on the corridor. The transportation and traffic impacts of alternatives that were evaluated are summarized.

3.1 Changes to this Chapter since the Draft EIS

This chapter has been revised to reflect the identification of the Light Rail Alternative as the Preferred Alternative for the LYNX Blue Line Extension Northeast Corridor Light Rail Project (LYNX BLE). Additionally, since the Draft Environmental Impact Statement (EIS), design of the LYNX BLE has been refined as described in Chapter 2.0: Alternatives Considered. The forecast year used for the project's transit ridership projections and regional transportation evaluation measures has been changed from 2030 to 2035, consistent with the region's Long Range Transportation Plan. The forecast year used for the project's traffic analysis continues to be 2030. These refinements are included in this chapter and reflected in the analysis of potential impacts of the proposed project.

3.2 Affected Environment

Affected Environment describes the existing (2008/2009) and projected (2030/2035) transportation conditions in the Northeast Corridor, without implementation of a major transit investment. These transportation conditions are described in terms of travel patterns, public transit service, street and highway facilities, freight and passenger rail service and bike and pedestrian facilities.

3.2.1 Travel Patterns

Travel patterns refer to the number and type of trips made between different portions of the region as a result of the distribution of population and employment. These travel patterns are grouped by the trip interactions between "centers," "corridors" or "wedges," as defined in the *Centers, Corridors and Wedges Growth Framework (*August 2010). Corridors are the five primary travel and growth areas that extend from Center City Charlotte (central business district or CBD) outward to the edge of its jurisdiction. There are five corridors: North, Northeast, South, Southeast and West. Wedges are those areas situated between the five principal transportation corridors. Travel patterns are described in two ways: by purpose and orientation and by mode.

3.2.1.1 Travel by Purpose and Orientation

Travel by purpose identifies the intent behind an individual's trip. Orientation identifies the origin and destinations of that trip. For this study, trip purpose is classified as trips from home to work, from home to university, from home to other locations, and non-home based. Travel orientations have been defined to include trips from different parts of the study area to Center City Charlotte, between transit corridors, within the Northeast corridor and to the Concord/Kannapolis area. All remaining trips are those between other parts of the Charlotte area traveling through the study area and are defined as other trips.

Based on regional travel demand forecasts, all purpose travel in the Charlotte region is projected to increase approximately 62 percent for both peak period trips (morning and afternoon rush hours) and total daily trips from 2009 to 2035. Similarly, the Northeast Corridor is projected to increase approximately 66 percent for both peak period trips and total daily trips. The percent of trips by purpose in 2035 is expected to be 16 percent home-work trips, 45 percent home-based other trips, 38 percent non-home based and one percent home-based university trips. Table 3-1 summarizes the travel patterns within the Northeast Corridor in 2009 and 2035.

Table 3-1
Study Area Daily Trips by Purpose and Orientation, 2009 and 2035

	2009 Person-trips					2035 Person-trips				
Travel Orientation	**Total HBW[1]**	**Total HBO[2]**	**Total NHB[3]**	**Total HBU[4]**	**Total**	**Total HBW[1]**	**Total HBO[2]**	**Total NHB[3]**	**Total HBU[4]**	**Total**
Travel to CBD										
NE to CBD	11,948	16,305	21,068	215	49,536	16,204	27,054	36,580	534	80,372
East wedge to CBD	18,522	16,236	14,416	338	49,513	21,782	21,733	19,819	810	64,143
North/NE wedge to CBD	9,472	11,872	10,667	151	32,162	11,682	16,292	17,584	376	45,935
Concord/ Kannapolis to CBD	5,699	654	2,090	2	8,445	6,824	1,125	2,469	7	10,426
Subtotal	45,642	45,067	48,242	706	139,656	56,491	66,204	76,452	1,728	200,875
Travel to/from Corridors										
NE to/from South Corridor (SC)	5,831	5,109	7,202	83	18,225	6,700	8,024	10,611	78	25,412
NE to/from North Corridor	4,852	6,459	5,761	1,041	18,113	10,031	15,008	14,452	2,668	42,159
NE to/from SE Corridor	7,354	23,319	19,697	857	51,227	9,816	31,353	29,001	809	70,979
NE to/from West Corridor	3,644	4,481	6,596	135	14,856	5,722	6,646	10,927	103	23,398
North/NE wedge to/from South Corridor	4,891	4,362	4,669	11	13,932	5,320	5,607	6,660	17	17,605
NE to/from East Wedge	13,821	47,879	32,053	2,554	96,307	22,525	67,236	52,089	3,632	145,482
NE to/from South Wedge	4,111	5,506	5,245	150	15,012	4,286	7,026	6,850	98	18,261
NE to/from Concord/ Kannapolis	13,927	32,737	33,927	1,735	82,326	22,154	53,004	52,660	2,869	130,687
Subtotal	58,431	129,852	115,149	6,566	309,998	86,554	193,903	183,250	10,274	473,982
Within NE Corridor	14,459	63,819	68,581	4,960	151,819	25,875	100,155	118,708	7,793	252,530
NE Corridor Related Trips (excluding CBD)	117,641	319,422	300,480	20,055	757,598	185,893	482,513	497,690	31,050	1,197,147
All other Travel, Region	1,301,682	3,740,094	3,129,767	58,094	8,229,637	2,145,606	6,001,793	5,088,192	89,543	13,325,134
Region Total	1,316,141	3,803,913	3,198,348	63,053	8,381,456	2,171,481	6,101,947	5,206,900	97,336	13,577,664

[1] Home Based Work, [2] Home Based Other, [3] Non Home Based, [4] Home Based University
Source: AECOM and Metrolina Regional Travel Demand Model, 2011

3.2.1.2 Regional Travel by Mode

Daily person-trips forecast by mode for 2009 and the 2035 No-Build Alternative are shown in Table 3-2. The table presents the number and percentages of work and non-work trips predicted to be made in 2035 on transit and highways, categorized by mode of access.

Table 3-2
Regional Daily Person-Trips by Mode, 2009 and 2035

Purpose and Mode	2009 Person-Trips		2035 Person-Trips No-Build Alternative	
	Person-Trips	Percent of Total	Person-Trips	Percent of Total
Transit Person-Trips				
Walk to Transit	38,128	75.0%	79,364	81.3%
Drive to Transit	9,467	18.6%	13,254	13.6%
Drop-off to Transit	3,221	6.3%	4,978	5.1%
Highway Person-Trips				
Work Trips				
Drive Alone	1,176,510	14.4%	1,935,375	14.6%
Carpool 2	80,229	1.0%	131,391	1.0%
Carpool 3+	24,522	0.3%	39,918	0.3%
Non-Work Trips				
Drive Alone	3,841,642	46.9%	6,194,807	46.8%
Carpool 2	1,881,563	23.0%	3,032,491	22.9%
Carpool 3+	1,187,190	14.5%	1,913,760	14.4%
Total Transit Person-Trips	50,815	0.6%	97,595	0.7%
Total Highway Person-Trips	8,191,656	97.7%	13,247,743	97.6%
Total Non-Motorized Person-Trips (Walk/Bike)	138,985	1.7%	232,325	1.7%
Total Person-Trips	8,381,456		13,577,664	

Source: AECOM and Metrolina Regional Travel Demand Model, 2011

3.2.2 Public Transit Service

Charlotte Area Transit System (CATS) is currently the only public transit service provider that operates within the Northeast Corridor. In FY 2009, CATS operated a total of 82 fixed routes; including the LYNX Blue Line light rail transit service, the Charlotte Trolley, local, express and regional express fixed bus routes, as well as community and neighborhood shuttle service to neighborhoods and business parks. CATS also operated vanpool and paratransit service. Collectively, CATS transported more than 18 million annual passengers.

The existing LYNX Blue Line light rail operates service from 7th Street in Center City Charlotte to the I-485/South Boulevard Station near the town of Pineville. The light rail serves 15 stations, including eight walk-up stations and seven stations with park-and-ride facilities. The light rail operates between the hours of 5:25 a.m. and 1:12 a.m.

CATS previously operated the Charlotte Trolley. This service traversed a portion of the existing LYNX Blue Line tracks from Tremont Avenue to 9th Street, with 11 stops from Atherton Mill to 9th Street. Due to budgetary constraints, CATS discontinued regularly scheduled trolley service July 1, 2010.

In FY 2009, CATS fixed route bus service included: 61 local and crosstown bus, neighborhood and community shuttles; 13 express routes that serve Mecklenburg County; and 6 regional express bus routes that provided service from Mecklenburg County to surrounding counties. These services primarily originated from the main transit hub known as the Charlotte Transportation Center.

The Charlotte Transportation Center is located in Center City Charlotte between Trade Street and East 4th Street next to the existing LYNX Blue Line light rail. The Charlotte Transportation Center provides a location for transfer opportunities between bus routes, as well as a direct connection to the light rail.

CATS provides additional transfer opportunities at three community transit centers, located outside of Center City Charlotte: Rosa Parks Place Community Transit Center, Eastland Community Transit Center and South Park Community Transit Center.

3.2.2.1 Fleet Characteristics

CATS operates a fleet of 403 buses (*CATS Bus Fleet Management Plan*, May 2009) and 20 light rail vehicles. The bus fleet consists of 173 forty-foot Local Buses (low and high floor), 91 forty-foot Suburban Style Express Buses, 40 thirty-foot Shuttle buses, 20 rubber-wheeled Trolley Buses and 85 Special Transportation Cutaway Vans for paratransit service.

The CATS fleet is maintained in three separate maintenance facilities. The South Tryon Bus Facility is the principal bus operations and maintenance facility with the capacity to store and maintain 250 buses. The Davidson Street Bus Facility is CATS' secondary bus facility with a capacity of 200 buses. The South Boulevard Light Rail Facility is the principal light rail storage facility and provides heavy and light maintenance services for 20 light rail vehicles.

3.2.2.2 Service Area Coverage

As of January 2009, 16 bus routes operated within the Northeast Corridor study area, with eight local bus routes, three University of North Carolina Charlotte shuttle routes, two neighborhood circulator routes and three express routes. The routes are described as follows and illustrated graphically in Figure 3-1.

- **Route 3** – The Plaza. This route provides service along North Davidson Street and The Plaza from Center City Charlotte to Central Piedmont Community College (CPCC) – CATO Campus. The route serves NoDa and Hampshire Hills neighborhoods, and the University Commercial Place.
- **Route 4** – Country Club. This route serves the Villa Heights, Plaza Hills, Plaza Midwood, and Country Club neighborhoods from Center City Charlotte. The route utilizes 7th Street, Parkwood Avenue and Matheson Avenue.
- **Route 11** – North Tryon. This route provides service along North Tryon Street/US-29 from Center City Charlotte to the UNC Charlotte main campus. The route serves neighborhoods, commercial and business complexes, the Sugar Creek Service Center and the University City Municipal Service District along North Tryon Street/US-29.
- **Route 13** – Nevin Road. This route provides service from Center City Charlotte to Nevin Road, primarily operating along North Tryon Street/US-29, Statesville Avenue, and Nevin Road. The route serves various neighborhoods and businesses, as well as the Nevins Center.
- **Route 22** – Graham Street. This route provides service along North Graham Street and Mallard Creek Road from Center City Charlotte to W.T. Harris Boulevard and the University Research Park. The route serves various neighborhoods along North Graham Street, as well as apartment complexes like the Prosperity Creek Apartments. The route also serves employment destinations within the University Research Park, including the Mecklenburg County 311 Call Center.
- **Route 23** – Shamrock Drive. This route provides service between the NoDa neighborhood and East Towne Market. The route operates from Center City Charlotte via North Davidson Street, Shamrock Drive, W.T. Harris Boulevard and Hickory Grove Road.
- **Route 29** – UNC Charlotte/South Park. This route provides local crosstown service between the South Park Community Transit Center and the UNC Charlotte main campus. The route serves destinations such as South Park Mall, Cotswold Shopping Center, Eastland Community Transit Center, the CPCC CATO Campus, before terminating at the UNC Charlotte Main Campus. The route utilizes North Sharon Amity Road, The Plaza, W.T. Harris Boulevard and University City Blvd./NC-49.
- **Route 39** – Eastway. This route provides service from Center City Charlotte to the Northpark Mall and Eastway Shopping Center, via Central Avenue, Eastway Drive and North Tryon Street/US-29. The route also serves the Presbyterian Hospital and CPCC Main Campus.
- **Route 47** – UNC Charlotte Nugget Shuttle. This shuttle route operates within the UNC Charlotte campus, providing students a mode to travel between dormitories and classrooms.
- **Route 49** – UNC Charlotte Niner Shuttle. This shuttle route operates within the UNC Charlotte campus, providing students a mode to travel between dormitories and classrooms.

- **Route 50** – UNC Charlotte - Charlotte Research Institute (CRI) Shuttle. This shuttle route operates within the UNC Charlotte campus, providing students a mode to travel between dormitories, classrooms and the UNC Charlotte CRI Campus.
- **Route 54x** – University Research Park. This is an express bus route serving Center City Charlotte and the University Research Park. The route utilizes Trade Street, Interstate 77 (I-77), Interstate 85 (I-85), City Boulevard, serving the CATS JN Pease Place Park-and-Ride, University Research Park and the Wachovia Customer Information Center (CIC) campus. The route operates express between Trade/Cedar Streets and I-85/City Boulevard.
- **Route 80x** – Concord Express. This is an express plus bus route serving the Center City Charlotte, various park-and-ride lots along North Tryon Street/US-29 and the City of Concord. There are four park-and-ride lots along the route: University Place Park-and-Ride in Charlotte, and the Lowe's Motor Speedway, Big Lots Shopping Center, and the Target/Home Depot Shopping Center Park-and-Rides in the City of Concord. The route operates express and does not stop between Center City Charlotte and University Place Park-and-Ride.
- **Route 81x** – Wachovia CIC Express Shuttle. This is an express bus route serving Center City Charlotte and the Wachovia CIC Campus in the University Research Park area. The route utilizes I-77 and I-85, operating express with no stops between Center City Charlotte and the Wachovia CIC Campus. (Note: this route was discontinued in FY 2011.)
- **Route 204** – LaSalle. This route is a neighborhood circular route serving Oakview Terrace, the Rosa Parks Place Community Transit Center, the Lincoln Heights and Druid Hills neighborhoods, and the Sugar Creek Service Center. The route utilizes local neighborhood streets, LaSalle Street, Statesville Avenue, Norris Avenue, 30th Street, North Tryon Street/US-29, Craighead Road, Glory Street and West Sugar Creek Road before terminating at the Sugar Creek Service Center.
- **Route 211** – Hidden Valley. This route is a neighborhood circular route serving the Hidden Valley neighborhood and the Sugar Creek Service Center. The route utilizes North Tryon Street/US-29, West Sugar Creek Road, Tom Hunter Road and local neighborhood streets.

3.2.2.3 Operating Characteristics

CATS operates more frequent headways during the weekday peak periods and less frequent headways during off-peak hours and the weekends. Headways for all 16 routes operating within the Northeast Corridor vary in both the peak and off-peak periods. To determine a standard headway for these periods, the average of the individual headway for a particular route within these periods was rounded to the nearest five-minute interval time. The standard headways for each route are presented in Table 3-3.

Table 3-3
Operating Characteristics for Routes Serving the Northeast Corridor, 2008

Route Number	Route Name	Type of Route	Peak Headway (minutes)	Off-Peak Headway (minutes)
3	Plaza Road	Local	20	40
4	Country Club	Local	20	35
11	North Tryon/Sugar Creek	Local	10	25
13	Nevin Road	Local	30	30
22	Graham Street	Local	35	40
23	Shamrock Drive	Local	20	40
29	UNC Charlotte/South Park	Local	60	60
39	Eastway Drive	Local	35	45
47	UNC Charlotte Nugget Shuttle	Shuttle	10	15
49	UNC Charlotte Niner Shuttle	Shuttle	10	15
50	UNC Charlotte CRI Shuttle	Shuttle	15	25
54x	University Research Park	Express	10	n/a
80x	Concord Express	Express	15	n/a
81x[1]	Wachovia CIC Shuttle	Express	60	n/a
204	LaSalle	Neighborhood	30	60
211	Hidden Valley	Neighborhood	20	25

n/a – Not Applicable; route operates only in peak period
[1]Route Discontinued in FY2011

3.2.2.4 Fare Structure

CATS offers a variety of fares for services structured by rider characteristic and the service provided. One-way fares (based on July 2010 rates) for local bus trips and on the LYNX Blue Line are $1.75; $.70 for neighborhood and community shuttles; $2.40 for Express routes within Mecklenburg County and $3.50 for Express Plus routes to neighboring counties. CATS also offers round-trip, one-day, weekly, monthly and 10-ride passes. Discounted fares are available for Youth/Students (grades K-12), persons with disabilities and seniors (age 62+).

3.2.2.5 Ridership

CATS fixed route transit services provided transit service to over 22 million passengers in FY 2008 and over 25 million passengers in FY 2009, a ridership increase of 12.5 percent. The success of the LYNX Blue Line light rail (established November 26, 2007) contributed to this ridership increase. Between November 26, 2007 and June 30, 2008 the LYNX Blue Line carried 2.9 million passengers, and during FY 2009 the line carried over 5 million passengers.

Two of the Northeast Corridor routes are ranked in the top ten of CATS system-wide routes with respect to average ridership, Route 11 – North Tryon/Sugar Creek and Route 23 – Shamrock Drive. In FY 2008, routes in the northeast corridor served a total of 4.9 million passengers, which increased to 5.2 million passengers in FY 2009; overall ridership in the corridor increased by 5.2 percent between FY 2008 and 2009. The Northeast Corridor also experienced a slightly higher rate of growth compared to the total CATS bus system ridership. Ridership numbers for FY 2008 and FY 2009 as well as the system-wide rank for the 16 bus routes in FY 2009 the corridor are shown in Table 3-4.

Table 3-4
Annual Ridership for Routes Serving the Northeast Corridor

Route Number	Route Name	Type of Route	FY 08	FY 09	Percent Change	System-wide Rank FY 09
3	The Plaza	Local	489,306	522,933	6.9%	13
4	Country Club	Local	296,778	313,819	5.7%	22
11	North Tryon	Local	1,393,864	1,431,834	2.7%	2
13	Nevin Road	Local	280,012	342,952	22.5%	20
22	Graham Street	Local	406,921	415,418	2.1%	16
23	Shamrock Drive	Local	572,559	607,503	6.1%	8
29	UNCC/SouthPark	Local	121,332	127,928	5.4%	40
39	Eastway Drive	Local	432,386	433,927	0.4%	15
47	UNCC Nugget Shuttle	Shuttle	83,808	56,401	-32.7%	59
49	UNCC Niner Shuttle	Shuttle	92,107	88,874	-3.5%	49
50	UNCC CRI Shuttle	Shuttle	38,320	52,967	38.2%	63
54x	University Research Park	Express	235,707	235,747	0.0%	27
80x	Concord Express	Express Plus	89,055	101,544	14.0%	47
81x[1]	Wachovia CIC Shuttle	Express	34,854	45,054	29.3%	66
204	LaSalle	Neighborhood	100,415	124,649	24.1%	41
211	Hidden Valley	Neighborhood	249,626	270,556	8.4%	26
Corridor Total			**4,917,050**	**5,172,106**	**5.2%**	
Bus System Total			**19,760,670**	**20,404,761**	**3.3%**	
Light Rail			**2,851,717**	**5,024,055**	**76.2%**	
Total Bus & Light Rail			**22,612,387**	**25,428,816**	**12.5%**	

Note: Light Rail Ridership service began in the second quarter of FY 2008.
Source: *Schedule Adherence by Route FY 2009 (July 1, 2008 - June 30, 2009)*
[1]Route Discontinued in FY 2011

3.2.2.6 System Performance

The existing bus routes within the Northeast Corridor currently operate in mixed-traffic on congested roadways. Therefore, the ability for CATS' bus operators to complete their routes as scheduled as well as the reliability of the service for the customer is subject to local street conditions. Presently, the most direct service operating through the corridor is provided by Routes 11 North Tryon and 80x Concord Express. During FY2009, Route 11 ranked 64th of 80 fixed bus routes for on-time performance, with 14.7 percent late trips; performing below the system average for schedule adherence of 10.4 percent late trips.

As a result of operating in mixed traffic on congested roadways, several of the Northeast Corridor routes consistently experience delays above the system-wide average. Table 3-5 presents the Northeast Corridor routes ranked by schedule adherence as compared to the system average.

Table 3-5
Northeast Corridor Routes Ranked by Schedule Adherence as Compared to System Average

Route Number	Route Name	Type of Route	Percent Late	Rank by Schedule Adherence
Perform at or Above System Average				
4	Country Club	Local	3.8%	3
204	LaSalle	Circulator	6.0%	10
3	The Plaza	Local	6.9%	19
23	Shamrock Drive	Local	7.6%	24
13	Nevin Road	Local	8.1%	28
System Average FY 2009			***10.4%***	
Perform Below System average				
80x	Concord	Regional Express	11.9%	52
22	Graham Street	Local	12.2%	54
211	Hidden Valley	Circulator	12.4%	55
81x[1]	Wachovia CIC	Express	12.7%	56
29	UNCC/SouthPark	Local	14.3%	63
11	North Tryon	Local	14.7%	64
39	Eastway	Local	19.6%	76
54x	University Research Park	Express	19.7%	77

Source: *CATS Schedule Adherence by Route FY 2009 (July 1, 2008 - June 30, 2009)*
[1]Route Discontinued in FY 2011

3.2.2.7 Planned Transit Improvements

Over the next 25 years, numerous transit improvements have been identified and are included in the *2030 Transit Corridor System Plan*. Planned improvements range from improving the existing bus service, constructing transit corridors and facility improvements. Two other transit corridors, Southeast and West are in the planning process, while the Streetcar and North Corridor are in the design phase.

Specific improvements outlined in the *North Carolina Department of Transportation (NCDOT) 2009-2015 Transportation Improvement Program (TIP)* include:

- Bus Facility Improvements (TIP project TM-4701): planning, design and construction of various bus facility improvements, including shelters, signs and associated amenities.
- Transit Right-of-Way Protection – TIP project TE-4704: purchase or lease existing rail right-of-way outside of the transit corridors as funding opportunities become available through abandonment or joint use agreements.
- North Corridor Transitway (TIP project TE-4902): design, land acquisition and construction.
- Intelligent Transit Systems (TIP project TT-4906): installation of various Intelligent Transit System components such as, automated interactive voice response systems, customer information technology at transit hubs, trip planning software and other software licenses to improve the operating efficiency of the system.
- Charlotte Gateway Station (TIP project TD-4911): final design and construction of a new multi-modal transit center in Center City Charlotte near Trade Street and Graham Street.
- Park-and-Ride lots (TIP project TD-4704): planning, design and construction of park-and-ride lots throughout the transit service area.
- Replacement and expansion of Vanpool Vans, Buses and Paratransit Buses (TIP projects TA-4960, TA-4716, TA-4710 and TA-4711): replacement and expansion of these vehicles types.

Specific improvements outlined in the latest *Draft NCDOT 2012-2018 Transportation TIP* include:

- Replacement and expansion of Vanpool Vans, Buses and Paratransit Buses: (TIP projects TA-4710, TA-4711, TA-4716, TA 4785, TA-4960, TA-5121, TA 5125 and TA 6515) replacement and expansion of these vehicles types.
- Bus Facility Improvements: (TIP projects TD-4701, TD-4702, TD-4703 and TD-4704) facility maintenance and construction, transit center upgrades, as well as the planning, design and construction of various park-and-rides throughout the transit service area.

- Fixed Guideway: (TIP project TE-4901) Blue Line Extension planning, design, acquisition and construction; (TIP project TE-5103) Charlotte Streetcar planning, design, acquisition and construction.
- Routine Capital: (TIP projects TG-4703, TG-4726, TG-4827, and TG-5118) maintenance of N. Davidson bus garage; bus stop shelters, benches, shop equipment, spare parts, engines, and fareboxes; service vehicles; and rail).
- Preventative Maintenance: (TIP project TG-5119) rail, bus and facilities.
- Operating Assistance: (TIP projects TO-4701, TO-4796, TO-5137 and TQ-6505) various routes throughout the transit service area.
- Mobility: (TIP projects TQ-6505 and TQ-6509) operating assistance for elderly/disabled persons, mobility assistance for elderly/disabled persons.
- Safety & Security: (TIP projects TS-5107 and TS-5132) minimum one percent reserve, and passenger assistance telephones on LYNX Line.
- Intelligent Transit Systems: (TIP projects TT-4906 and TT-5215) installation of various Intelligent Transit System components such as, vehicle tracking, passenger information, data communications, traffic signal priority, automated interactive voice response systems, Digital Media and Content Management System, Real Time Passenger Information System, to improve the operating efficiency of the system.
- Fixed Guideway Modernization (TIP projects TW-4901, TW-5102 and TW-5104) rail bridge inspection and emergency repairs; bus and rail state of good repair.

3.2.3 Streets and Highways

This section describes the existing roadway network within the Northeast Corridor (including pedestrian and bicycle facilities), the planned improvements that are identified in the Mecklenburg-Union Metropolitan Planning Organization's (MUMPO) *Long Range Transportation Plan* (LRTP), major roadway traffic volumes and travel speeds, and existing parking.

3.2.3.1 Existing Roadway Network

The existing roadway network within the Northeast Corridor consists of North Tryon Street/US-29, University City Blvd./NC-49 and other interstates, arterials, collector streets and local streets. Major roadways and railroads within the corridor are shown graphically in Figure 3-2.

Major north/south and east/west roadways in the corridor include:

- Interstate 85 (I-85) - an eight-lane controlled access freeway which functions as the primary commuter travel route in the Northeast Corridor. I-85 parallels North Tryon Street/US-29 for most of the corridor.
- North Tryon Street/US-29 - a major thoroughfare varying between four and six lanes with center turn lanes and median divided sections throughout.
- Old Concord Road - a two-lane thoroughfare mostly running parallel with North Tryon Street/US-29 and University City Blvd./NC-49.
- University City Blvd./NC-49 - a four-lane thoroughfare running parallel with North Tryon Street/US-29 between the I-85 Connector Road and Interstate 485 (I-485).
- Sugar Creek Road - a four-lane thoroughfare providing cross-town access and direct access to I-85 and Eastway Drive.
- Eastway Drive - a four-lane thoroughfare connecting North Tryon Street/US-29 with Sugar Creek Road and southeast Charlotte.
- I-85 Connector Road - a four-lane road providing direct access from North Tryon Street/US-29 to I-85.
- W.T. Harris Boulevard - a four and six-lane thoroughfare providing east/west access and direct access to I-85 and University City Blvd./NC-49.
- Mallard Creek Church Road - a four-lane thoroughfare providing direct access to I-85, North Tryon Street/US 29 and University City Blvd./NC-49.
- Interstate 485 - a six-lane controlled access freeway which functions as Charlotte's outer beltline.

3.2.3.2 Planned Roadway Improvements

Future roadway improvements are identified in the region's financially constrained LRTP. Projects that are listed as programmed are scheduled to be undertaken within the next five to seven years, and are included in the NCDOT's TIP or the City of Charlotte's CIP. Planned roadway improvements are those that have been identified in the financially constrained *Long Range Transportation Plan*, but have not yet been programmed and funded in the current TIP or CIP. Numerous transportation improvements, including North Tryon Street/US-29 were identified as needed transportation improvements, but were not funded in the 2035 LRTP.

The adopted transportation plans at the time of analysis were used as the basis for this Final EIS: the *2035 LRTP*, the *NCDOT 2009-2015* TIP, and the City of Charlotte's *FY 2010 – 2014 Capital Investment Plan* (CIP). Programmed projects within the Northeast Corridor are presented in Tables 3-6a, 3-6b and 3-7. The LRTP planned improvements within the Northeast Corridor and the horizon year for which the proposed projects are anticipated to be in place are summarized in Table 3-8. Figure 3-3 displays the planned and programmed transportation projects from the *2009-2015 TIP* and *2035 LRTP* within the Northeast Corridor. The following Draft plans are presented for information: the *NCDOT 2012-2018 Draft TIP*, the City of Charlotte's *FY 2010 – 2014 Capital Investment Plan* (CIP), and the City of Charlotte's *FY 2011-2015 CIP*.

Table 3-6a
2009-2015 NCDOT TIP Programmed Transportation Projects within the Northeast Corridor

Facility	Project Description	TIP #	Project Cost
North Tryon Street/US-29	Replace Southbound Bridge #147 over Mallard Creek	B-4779	$3,300,000
Amtrak	Train operations between Charlotte & Rocky Mount	P-2908	$16,619,000
Amtrak	Train operations between Charlotte & Raleigh	P-2918	$23,928,000
Sugar Creek Road	Grade separate Sugar Creek Road from the existing freight tracks	U-5008	$2,580,000 (no construction $)
Mallard Creek Road (Sugar Creek Road to W.T. Harris Boulevard)	Widen and Relocate to four-lanes with median and bike lanes	U-2507A	$18,300,000
I-485	New Freeway (8 lanes), from NC 115 to I-85	R-2248E	$167,500,000
I-85 / I-485	Construct new interchange	R-2123CE	80,000,000
I-85	Improvements from I-485 to Hwy. 73	I-3803B	$221,581,000

Source*: North Carolina Department of Transportation*

Table 3-6b
2012-2018 NCDOT Draft TIP Programmed Transportation Projects within the Northeast Corridor

Facility	Project Description	TIP #	Total Project Cost
I-85	North Tryon Street/US-29/University City Blvd./NC-49 Connector in Mecklenburg County to NC 73 in Cabarrus County. Add lanes.	I-3803	$292,991,000
I-85	Mile Marker 42-49 Pavement Rehabilitation.	I-5394	$7,300,000
I-85	Mile Marker 36-42 Pavement Rehabilitation.	I-5369	$8,900,000
I-85	Mile Marker 36-42 On-ramp Pavement Rehabilitation.	I-5347	$100,000
I-485	Mile Marker 31-33 Pavement Rehabilitation.	I-5344	$2,900,000
City Boulevard Extension	Relocated Mallard Creek Road to North Tryon Street/US-29/ University City Blvd./NC-49. (4 lanes divided, part on new location)	R-2420	$24,771,000
I-485	New Freeway (8 lanes), from NC 115 to I-85	R-2248	$751,926,000
I-85 / I-485	Freeway on New Location. Construct new interchange.	R-2123	$333,929,000
Sugar Creek Road	Depress/elevate Sugar Creek Road under/over the existing freight tracks.	U-5008	$4,000,000
Metrolina Transportation Management Center Interconnect (MTMCI)	Extend MTMCI: Install communication cable and roadside equipment I-85 from I-485 to Mallard Creek Church Road, University City Blvd./NC-49 at I-485	U-4754	$1,295,000
Belmont Neighborhood	Infrastructure and Streetscape Improvements	U-4911	$1,229,000
Upgrade/Expand Traffic Signal Management System in Mecklenburg County	University Area – North Tryon Street/US-29, W.T. Harris Blvd., and University City Blvd./NC-49	U-5133	$3,914,000
Mallard Creek Road	(Sugar Creek Road to W.T. Harris Blvd.) Widen to multilane part on new location.	U-2507	$46,907,000
North Tryon Street/US-29	Replace Southbound Bridge #147 over Mallard Creek	B-4779	$3,476,000
Toby Creek Greenway	University City Blvd./NC-49 at W.T. Harris Blvd. to Mallard Creek through the UNC Charlotte Campus. Construct Greenway	EB-5120	$1,240,000
Toby Creek Greenway	University City Blvd./NC-49 to W. Rocky River Road	EB-5524	$1,500,000
University City Blvd./NC-49 Multi-use Path	Construct 10’ Multiuse Path on the North Side of University City Blvd./NC-49 between Mallard Creek Church Road and Broadrick Blvd.	C-5227	$500,000
Toby Creek Greenway Phase II	Connect UNC Charlotte to Retail and Residential Development	C-5225	$1,810,000
Old Concord Road	Bicycle Improvements	C-4958	$500,000
Crossing Consolidation Projects SEHSR	Crossing Consolidation Projects as Identified in South End SEHSR Traffic Separation Study	P-3814	$597,000
Private Crossing Safety Initiative Raleigh-Charlotte	Private Crossing Safety Initiative Close/Enhance Protection at Railroad Crossings between Raleigh and Charlotte	P-4405	$24,440,000
Amtrak	Train 79/80 operations between Charlotte & Rocky Mount	P-2908	$47,795,000
Charlotte/Mecklenburg	Track and Station Right of Way Acquisition	P-3800	$241,000
Charlotte Mainline Grade Separation	Charlotte Mainline Grade Separation CSX-NS-CATS and Move Tryon Yard to Pinoca Yard	P-5002	$129,208,000
Amtrak	Train 73/74 Operations Between Charlotte & Raleigh; Equipment and Capital Yard Maintenance Facility	P-2918	$214,284,000

Source*: North Carolina Department of Transportation, MUMPO*

Table 3-7
City of Charlotte FY 2010-2014 CIP Programmed Improvements within the Northeast Corridor

Facility	City of Charlotte Department	Project Status	Anticipated Construction Year	Project Cost
Davidson Street at Craighead Road	Transportation	On-Hold	n/a	$300,000
Belmont-Gateway	Neighborhoods	Construction	2011	$600,000
Newell-South Neighborhood Improvement Project (NIP)	Neighborhoods	Real Estate	2012	$3,400,000
Sugaw Creek/Ritch NIP	Neighborhoods	Real Estate	2012	$3,000,000
John Kirk Drive/University Boulevard Intersection Improvements	Planning	Complete	n/a	$2,100,000
Countryside Sidewalk	Transportation	Complete	n/a	$350,000
Hidden Valley NIP, Phase 6	Neighborhoods	Construction	2011	$950,000
Tryon Hills NIP	Neighborhoods	Real Estate	2012	$4,000,000
Howie Acres Phase 2	Neighborhoods	Design	2012	$1,500,000
North Tryon Street/US-29 & University City Blvd./NC-49 Interchange (the weave)	Transportation	Construction	2010	$25,500,000
City Blvd. Extension	Transportation	Design	2012	$10,800,000
Craighead Road Drainage Improvements	Storm Water	Construction	2011	$5,300,000
Louise Avenue CIP	Storm Water	Bid	2011	$11,300,000
Shopping Center Drive Extension	Transportation	Planning	TBD	TBD
University City Blvd./NC-49 Sidewalk	Transportation	Bid	2011	$1,200,000
University City Blvd./NC-49 / WT Harris Boulevard intersection improvements	Transportation	Complete	2010	$300,000
Atando Avenue Sidewalk	Transportation	On Hold	2012	$600,000
Back Creek Church Road FTM Improvements	Transportation	Planning	TBD	n/a
Brevard-Caldwell Two-Way Conversion	Transportation	On Hold	TBD	n/a
Galloway Road Sidewalk	Transportation	Complete	n/a	$250,000
Graham Street Sidewalk at I-85	Transportation	Bid	2012	$600,000
Grier Road Sidewalk	Transportation	Complete	n/a	$900,000
Mallard Creek Road Sidewalk	Transportation	Real Estate	2011	$600,000
Mineral Springs Road Sidewalk	Transportation	On Hold	n/a	n/a
North Tryon Business Corridor	Planning	Planning	n/a	n/a
Northeast Corridor Improvements (NECI)	Multiple	Planning	n/a	n/a
Salome Church Road at Mallard Creek Road Intersection	Transportation	Real Estate	2011	$950,000
Sugar Creek Road / Rumple Road Left Turn Lane	Transportation	Complete	2011	$750,000

Source: *City of Charlotte FY 2010-2014 CIP*

Table 3-8
Planned Future Roadway Improvements within the Northeast Corridor, 2035 LRTP

Facility	Project Limits	Type	2035 LRTP Horizon Year
City Boulevard	Neal Road to Mallard Creek Road Extension	New four-lane road with median and bike lanes.	2015
Mallard Creek Road	Sugar Creek Road to Harris Boulevard	Widen to four lanes. Includes median and bike lanes.	2015
Eastern Circumferential	University City Blvd./NC-49 to Rocky River Road	New four-lane road with median and bike lanes.	2035
I-485	NC-115 to I-85 North	New eight-lane freeway.	2015
I-485/I-85 North	Interchange	Construct New interchange.	2015
Pavilion Boulevard Extension	Salome Church Road to N. Tryon St. (US-29)	New two-lane road	2025

Source: *2035 LRTP*, MUMPO; Charlotte Department of Transportation.

3.2.3.3 Daily Traffic Volumes

Daily traffic volumes along the significant roadway segments in the Northeast Corridor were obtained from the Charlotte Department of Transportation (CDOT) and NCDOT. These volumes, presented in Table 3-9 as Annual Average Daily Traffic (AADT), represent traffic for a 24-hour period and include both directions of travel along each roadway segment.

Table 3-9
Existing Daily Traffic Volumes, 2008

Through Street	From	To	AADT	# of Through Lanes[1]	Source
North Tryon Street/US-29	32nd Street	Sugar Creek Road	25,000	5 (U)	NCDOT
North Tryon Street/US-29	Sugar Creek Road	Eastway Drive	30,000	5 (U)	NCDOT
North Tryon Street/US-29	Eastway Drive	Old Concord Road	43,600	5 (D)	CDOT
North Tryon Street/US-29	Old Concord Road	Orr Road	33,000	4 (U)	NCDOT
North Tryon Street/US-29	Orr Road	Orchard Trace Lane	33,000	4 (D)	NCDOT
North Tryon Street/US-29	Orchard Trace Lane	I-85 Connector	29,000	4 (D)	NCDOT
North Tryon Street/US-29	I-85 Connector	University City Blvd./NC-49	62,000	4 (D)	NCDOT
North Tryon Street/US-29	University City Blvd./NC-49	W.T. Harris Boulevard	27,000	4 (D)	NCDOT
North Tryon Street/US-29	W.T. Harris Boulevard	Mallard Creek Church Road	32,000	4 (D)	NCDOT
North Tryon Street/US-29	Mallard Creek Church Road	I-485	25,000	4 (D)	NCDOT
12th Street	North Davidson Street	North Tryon Street/US-29	13,000	3 (O)	NCDOT
36th Street	North Davidson Street	North Tryon Street/US-29	4,900	2 (U)	CDOT
North Davidson Street	28th Street	Sugar Creek Road	9,100	2 (U)	NCDOT
Craighead Road	Philemon Avenue	North Davidson Street	6,500	2 (U)	NCDOT
Sugar Creek Road	North Davidson Street	North Tryon Street/US-29	21,000	4 (U)	NCDOT
Sugar Creek Road	North Tryon Street/US-29	I-85	29,500	4 (U)	NCDOT
Eastway Drive	Curtiswood Drive	North Tryon Street/US-29	25,000	4 (D)	NCDOT
Old Concord Road	Orr Road	North Tryon Street/US-29	14,000	2 (U)	NCDOT
Orr Road	North Tryon Street/US-29	Old Concord Road	6,600	2 (U)	NCDOT
University City Blvd./NC-49	North Tryon Street/US-29	Shopping Center Drive	36,000	4 (D)	NCDOT
W.T. Harris Boulevard	I-85	North Tryon Street/US-29	78,000	6 (D)	NCDOT
W.T. Harris Boulevard	North Tryon Street/US-29	University City Blvd./NC-49	57,000	6 (D)	NCDOT
Mallard Creek Church Road[2]	I-85	North Tryon Street/US-29	27,800	4 (D)	CDOT
Mallard Creek Church Road[2]	North Tryon Street/US-29	University City Blvd./NC-49	19,700	4 (D)	CDOT

[1] (U) Undivided roadway, (D) Divided roadway, (O) One way street
[2] Updated traffic counts, 2010

3.2.3.4 Parking

Parking facilities within a ¼-mile radius of the proposed station locations were assessed along the corridor. Within Center City Charlotte there are over 45,000 parking spaces (public or private off-street facilities and on-street parking) available. Parking rates vary. Hourly rates range from $2 to $4 an hour, with a maximum daily charge of $20, while monthly rates range from $40 to $160 (*http://www.aboutparking.com/charlotte-map.asp*, accessed June 2011).

Parking facilities outside of Center City mainly consist of on-street parking or commercial shopping center parking lots. On-street parking varies depending on the surrounding land uses, traffic volumes, speeds and safety perspective. Numerous commercial shopping centers are located along the corridor providing public parking opportunities. Two other private locations contain large parking facilities, Carolinas Medical Center–University (CMC-University) and the UNC Charlotte campus.

For UNC Charlotte, the existing parking and future parking demands are near or over capacity. UNC Charlotte maintains 11,766 parking spaces on campus, divided between five parking structures and numerous surface parking lots; a sixth parking structure on the north side of campus was under construction during this report. Parking structures are located close to the academic core of the main campus and available to visitors, commuters, faculty and staff. Surface lots tend to be adjacent to university-owned residence halls, providing parking for resident students. However, there are surface parking lots for commuter students along John Kirk Drive (Lot 5, Lot 6), High-Rise Road (Lot 8), Cameron Boulevard (Lot 26,) and University Road (Lot 7). Parking fees at UNC Charlotte are $310 for full-year students, $190 for partial year students and $210 for remote parking for commuters. The *2009 Draft UNC Charlotte Campus Master Plan* notes that expansion of parking facilities is essential, as well as coordination with CATS on future bus and transit service in order to assist in reducing the need for campus parking.

3.2.4 Railroads

Charlotte is served by four existing rail lines which traverse the Northeast Corridor: the North Carolina Railroad (NCRR), Norfolk Southern Corporation (NS) and CSX Corporation (CSX), and one short haul line, the Aberdeen Carolina and Western Railroad (AC&W). Amtrak also operates passenger service through Charlotte.

Several improvements to both freight and passenger rail are planned for the near future. NCDOT Rail Division is working with NCRR and NS to improve the Raleigh-to-Charlotte rail corridor, and assist in reducing travel times for both freight and passenger rail. According to the NCDOT Rail Division (NCDOT Rail Division website, *http://www.bytrain.org*, accessed March 2010) plans are being designed for improvements between Raleigh and Charlotte, including double tracking from North Charlotte to Concord. A separate specific project that is located within the corridor addressing the improvements to rail service is the Charlotte Rail Improvement and Safety Project (CRISP). This project is intended to improve various rail operations in Charlotte by creating and/or maintaining accommodations for the proposed Southeast High Speed Rail corridor.

3.2.4.1 Freight Railroads

Two NS freight rail lines pass through Charlotte. One line approaches from the direction of Roanoke, Virginia and the second approaches from the direction of Washington, D.C. Just northeast of Center City Charlotte, the rail lines travel parallel to the NS intermodal yard then west towards Center City Charlotte, paralleling Graham Street; the rail lines head west towards Atlanta, Georgia or south towards Columbia, South Carolina. This NS line parallels North Brevard Street within the North Charlotte Historic District and operates the NS intermodal yard just northeast of Center City Charlotte between 16th Street and 30th Street. Section 3.1.6 describes the future plans for the NS intermodal yard. There is also an existing siding located near 27th Street.

The NCRR is the primary railroad leaser in the corridor, extending the full length of the corridor and forming the eastern boundary of the corridor at its northern end. The NS “O” Line and the CSX Corporation line pass through the southern end of the corridor. The AC&W diverges east from the NCRR

in the vicinity of 36th Street in NoDa. All four lines support freight operations. The NCRR also supports the Amtrak passenger rail service.

The state-owned NCRR stretches more than 300 miles from Charlotte to Morehead City, North Carolina. The section between Charlotte and Raleigh is the most active rail corridor in the state, supporting both freight and passenger services. Under a lease agreement with the state, Norfolk Southern operates main line freight service on the NCRR with an average of 30 to 35 train movements per day. These train movements are expected to increase to approximately 50 to 70 trains per day by the year 2030.

NCDOT's *North Carolina Rail Plan 2000* (January 2001) reports that 47 percent of the total freight rail traffic shipped on the North Carolina rail system in 1999 originated or terminated in North Carolina and 53 percent was pass-through freight. Since 1990, freight traffic on the mainline has substantially increased. The NCRR corridor recently completed $10 million worth of projects to improve the eastern portion of the corridor, which included curve improvements between Raleigh and Charlotte. Within Center City Charlotte, the City of Charlotte purchased the former NCRR right-of-way up to 12th Street for future transit use.

3.2.4.2 Passenger Railroads

Amtrak passenger rail operates on the NCRR through an agreement with NS. Currently, three different routes use the line: the Crescent (New York, Atlanta, and New Orleans); the Carolinian (New York, Charlotte) and the Piedmont (Charlotte, Raleigh). Each route operates to and from Charlotte daily, resulting in a combined six trains per day. The Charlotte Amtrak passenger station is currently located within the corridor along North Tryon Street/US-29, approximately two miles north of Center City Charlotte. A future separate project would relocate the passenger station to a new multi-modal transportation facility in Center City Charlotte, called the Charlotte Gateway Station, to be located along the NS main line in the vicinity of West Trade Street.

3.2.4.3 Grade Crossing Inventory

There are seven existing at-grade street crossings within the Northeast Corridor, as identified in Table 3-10. The crossings at 8th Street, 9th Street and 12th Street are along existing City of Charlotte owned right-of-way. The remaining at-grade crossings are located within the active rail corridor. All of these crossings are located on roadways that provide access to existing businesses and residential neighborhoods, and provide connectivity between neighborhoods, business parks, industrial parks and Center City Charlotte.

Table 3-10
Existing Grade Crossings within the Northeast Corridor

Grade Crossings	Number of Tracks	Number of Travel Lanes
8th Street	1	2
9th Street	1	2
12th Street	1	4
16th Street	6	2
36th Street	2	2
Craighead Road	2	2
Sugar Creek Road	2	4

3.2.5 Bikeways and Major Pedestrian Ways

3.2.5.1 Bicycle Facilities

Over the past decade, the City has improved the local environment for cyclists through a variety of measures, including:

- The construction of approximately 56 miles of bike lanes throughout the city.
- The incorporation of bicycle lanes into projects that are currently in the design phase.

- The adoption of a standard practice to provide bicycle lanes or additional space in the outside lanes, as streets are resurfaced.
- The addition of newly signed bicycle routes to the 39 mile inventory of signed bicycle routes.
- The construction of bicycle facilities in conjunction with the LYNX Blue Line, including a two-mile off-street pathway parallel to the rail line and over three miles of bicycle lanes on Old Pineville Road.
- The installation of bicycle parking facilities in Center City Charlotte and at most light rail stations.
- The construction of over 30 miles of Mecklenburg County Greenway off-street pathways, including the Mallard Creek Greenway (~6 miles), upper McAlpine Creek Greenway (~9 miles), lower McAlpine Creek/McMullen Creek Greenway (~5 miles), Torrence Creek Greenway (~1 mile), Irwin Creek Greenway (~2 miles), Little Sugar Creek Greenway (~3 miles), and the construction of the Toby Creek Greenway on the campus of the UNC Charlotte (within the northeast corridor).
- The development of the *Charlotte Cycling Guide*, which includes a map of existing bikeways, recommended routes and information related to bicycle safety and awareness. The adoption of bicycle parking requirements, requiring new and to construct bicycle parking for new and significantly modified land developments.
- The adoption of the *Urban Street Design Guidelines*. This policy document defines the street design for the various classifications of roadways within Charlotte. Bicycle accommodations are included for street classifications considered suitable for bicycling, including bicycle lanes, shared lanes and adjacent pathways.
- The adoption of the *2008 City of Charlotte Bicycle Plan*, a citywide bicycle planning document that identifies policies and strategies to expand the City's bicycle network and make cycling a safer and more efficient means of transportation. Most notable is Policy Strategy 3.1, which recommends that "the City will consider bicycle accommodations in the planning, design and development of all rapid transit corridors, station areas and transit hubs. On-going rapid transit planning should take bicycle accommodations into account in the station areas, along roadways leading to the stations, along the transit corridors and on the vehicles."

Table 3-11 lists key bicycle facilities planned in the Northeast Corridor. Additionally, Figure 3-4 depicts the planned bicycle facility improvements.

Table 3-11
Proposed Projects with Bikeways within the Northeast Corridor

Location	Type of Facility
North Tryon Street/US-29	Bicycle lanes
Matheson Avenue	Bicycle lanes
Old Concord Road	Bicycle lanes
West Rocky River Road	Bicycle lanes
Mallard Creek Church Road	Bicycle lanes
West Mallard Creek Church Road	Bicycle lanes
Salome Church Road	Bicycle lanes
Pavilion Boulevard	Bicycle lanes
Mallard Creek Greenway	Off-road trail
Toby Creek Greenway (completed in 2011)	Off-road trail

Source: *City of Charlotte Bicycle Plan, 2008*

3.2.5.2 Pedestrian Ways

Currently, in the Northeast Corridor, sidewalks are not consistently provided along the roadways. The continuity of the sidewalk network is minimal or non-existent in many areas; and gaps exist along North Tryon Street/US-29 north of W.T. Harris Boulevard. However, the network is more prevalent within Center City and in the NoDa area.

MUMPO works with NCDOT to incorporate sidewalk construction as a matter of standard practice on state roadway projects within the urban area. MUMPO takes a strong stance to ensure that new roadway construction projects provide room for future sidewalk improvements and do not create pedestrian barriers to the provision of pedestrian ways.

Additionally, the City establishes initiatives to provide multi-use paths through the CIP. The City funds both thoroughfare and non-thoroughfare multi-use path construction. It is the current policy to construct multi-use paths on both sides of all thoroughfares; on one side of all collectors; and, after assessing requests, on local streets. As such, CDOT identified the following needs:

- 685 miles of new multi-use path needs on both sides of Charlotte's thoroughfares; and,
- 1,400 miles of new multi-use path needs on one side of Charlotte's local and collector streets.

The current funding level allows for the construction of approximately ten miles of new sidewalks each year. In order to target the funds where they are most needed, CDOT utilizes a ranking system to evaluate each section of potential sidewalk and to prioritize the segment based upon traffic counts, connectivity to a variety of land uses, roadway safety, network completion and transit access.

3.2.6 Trucks and Intermodal

One of the region's major intermodal sites is currently located within the Northeast Corridor, the Norfolk Southern Intermodal Freight Terminal paralleling North Brevard Street. Norfolk Southern, however, is planning to construct a new intermodal terminal near the Charlotte-Douglas International Airport and relocate operations there.

3.3 Environmental Consequences

The following sections describe the potential impacts to the transportation system (transit, streets and highways, rail and non-motorized forms) of the No-Build and the Preferred Alternative. The impacts are a comparison among the alternatives under study.

3.3.1 Transit

Impacts to the public transportation service under the No-Build and the Preferred Alternative are measured in terms of their effectiveness in providing improved transit service to potential users in the corridor. Measures of transit service levels include the geographic coverage, operating characteristics, transfers, travel time, service reliability and safety of the transit system, as well as passenger comfort. The improved service levels should result in higher transit ridership. Therefore, the effectiveness of the alternatives is measured by ridership and system performance measures.

3.3.1.1 Geographic Coverage within Service Area

Under the Preferred Alternative, the type and quality of service would be improved. Fixed guideway transit service with a dedicated right-of-way would provide faster and more reliable service than bus service. The Preferred Alternative would provide park-and-ride facilities and feeder bus service that would expand the area that would have access to rail transit service.

3.3.1.2 Operating Characteristics

The operating plan for the Preferred Alternative is described in the following.

Light Rail Service Headways and Fleet Requirements

Under the Preferred Alternative, the light rail service for the opening year and the 2035 horizon year would operate at the frequencies shown in Table 3-12. The operating analysis indicated that two different operating scenarios would provide sufficient capacity and meet the proposed projected peak period demand for the 2035 forecast year. The first operating scenario would be two-car trains with six-minute headways. The second operating scenario would be three-car trains with 10-minute headways.

To minimize long-term operating costs, the proposed operating plan is to operate 2-car trains at 7.5 minute headways initially, and 3-car trains at 10 minute headways in the long term. The operating plan for the Preferred Alternative would require 18 vehicles to be added to the existing fleet of 20. This would bring the total light rail vehicle fleet for CATS to 38 vehicles.

Table 3-12
Proposed Light Rail Headways and Train Consists by Service Period

	Existing 2009		Opening Year		Forecast Year 2035	
	Headway	Train Consist	Headway	Train Consist	Headway	Train Consist
Peak Periods	10 minute	2-car	7.5 minute	2-car	10 minute	3-car
Base Periods[1]	15 minute	1.5-car	15 minute	1.5-car	15 minute	1.5-car
Evening	30 minute	1-car	20 minute	1-car	20 minute	1-car
Late Night	30 minute	1-car	30 minute	1-car	30 minute	1-car
Weekend Base[1]	20 minute	1.5-car	20 minute	1.5-car	20 minute	1.5-car
Weekend Early/Late	30 minute	1-car	30 minute	1-car	30 minute	1-car

[1]Note: A Base consist of 1.5 cars represents average consist size; either 1-car or 2-car trains would be operated throughout the period based on expected daily demand.
Source: *O&M Quantities & Costs LRT REV 02, 2011*

Bus Routes and Service Headways

As described in Chapter 2.0: Alternatives Considered, the No-Build Alternative would include improvements to service frequencies for routes operating within the Northeast Corridor. Under the Preferred Alternative, bus route alignments would be modified to feed into the light rail stations. The routing modifications are described below:

- **Route 3 – Plaza Road**: This route would provide service along The Plaza from the Sugar Creek station to the Central Piedmont Community College (CPCC) – CATO Campus. The route would serve the NoDa and Hampshire Hills neighborhoods.
- **Route 4 – Country Club**: This route would serve the Villa Heights, Plaza Hills, Plaza Midwood, and NoDa neighborhoods from Center City Charlotte to the Sugar Creek station. The route would travel along 7th Street, Parkwood Avenue, The Plaza, Matheson Avenue, and North Davidson Street.
- **Route 11 – North Tryon**: This route would provide service along North Tryon Street/US-29 from Center City Charlotte to the Old Concord Road Station. The route would serve neighborhoods such as Tryon Hills and Hidden Valley, as well as commercial and business complexes.
- **Route 13 – Nevin Road**: This route would provide service from Center City Charlotte to the University City Blvd. Station, primarily operating along North Tryon Street/US-29, Statesville Avenue, Nevin Road, Graham Street and City Boulevard. The route would serve neighborhoods including Druid Hills and Derita as well as The Nevins Center.
- **Route 22 – Graham Street**: This route would provide service along North Graham Street and Craighead Road from Center City Charlotte to the Sugar Creek Station. The route would serve various neighborhoods along North Graham Street, as well as apartment complexes along Craighead Road.
- **Route 23 – Shamrock Drive**: This route would provide crosstown service from Albemarle Road and Harrisburg Road to communities near I-85 and Highway 16. Transfer to light rail would be possible at the 36th Street Station, and would connect neighborhoods such as NoDa, Washington Heights, Druid Hills, Country Club Heights, and Hickory Grove.
- **Route 29 – UNC Charlotte/South Park**: This route would provide local crosstown service between the South Park Community Transit Center and the JW Clay Blvd. Station. The route would serve destinations such as South Park Mall, Cotswold Shopping Center, Eastland Community Transit Center, and UNC Charlotte. The route would utilize North Sharon Amity Road, The Plaza, W.T. Harris Boulevard and University City Blvd./NC-49.
- **Route 39 – Eastway Drive**: This route would provide crosstown service from the University City Blvd. Station to medical and social services along Billingsley Road. The route would primarily operate along North Tryon Street/US-29, Eastway Drive and Wendover Road. The route would also provide service to the Old Concord Rd. Station and would serve neighborhoods such as Hidden Valley, Hampshire Hills, Country Club Heights and Grier Heights.
- **Route 47 – UNC Charlotte Nugget Shuttle**: This shuttle route would operate within the UNC Charlotte campus, providing students a mode to travel between dormitories, classrooms, and the UNC Charlotte Station.
- **Route 49 – UNC Charlotte Niner Shuttle**: This shuttle route would operate within the UNC Charlotte campus, providing students a mode to travel between dormitories, classrooms, and the UNC Charlotte Station.

- **Route 50 – UNC Charlotte - Charlotte Research Institute (CRI) Shuttle**: This shuttle route would operate within the UNC Charlotte campus, providing students a mode to travel between dormitories, classrooms, the UNC Charlotte CRI Campus and the UNC Charlotte Station.
- **Route 54 – University Research Park**: This route would provide service from the University City Blvd. Station to employment locations in the University Research Park. The route primarily operates along City Boulevard, IBM Drive, W.T. Harris Blvd, David Taylor and Mallard Creek Church Road.
- **Route 80x – Concord Express**: This route would provide limited stop service from the City of Concord to the JW Clay Blvd. Station, primarily along US-29 in Cabarrus County. There would be three existing bus park-and-ride lots served along this route: Charlotte Motor Speedway, Big Lots Shopping Center, and the Target/Home Depot Shopping Center.
- **Route 110 – Concord Mills Mall**: This route would provide service from the Concord Mills Mall to the JW Clay Blvd. Station. Communities along Mallard Creek Road and Mallard Creek Church Road would also be served.
- **Route 125 – Derita/Prosperity Church**: This route would provide service from the University City Blvd. Station to communities along Prosperity Church Road, Mallard Creek Road and City Blvd. Examples include, senior citizen centers along Prosperity Church Road and the Derita community.
- **Route 211 – Hidden Valley**: This route would continue to be a neighborhood circular route. The route would serve the Hidden Valley neighborhood providing service to the Tom Hunter and Sugar Creek Stations. The route would utilizes North Tryon Street/US-29, West Sugar Creek Road, Tom Hunter Road and other local neighborhood streets.

Route headways in the Preferred Alternative would also be adjusted to provide more frequent service and minimize transfer waiting time. Route 11, 23, 54x would operate with less frequent service under the Preferred Alternative. Route 11 operates along the same alignment as the rail line and Route 23 parallels the rail line, therefore the reduced service on these lines is justified. Although Route 54x peak headways would change from 12 to 30 minutes, midday service would be added, and the route would change from an express to a local route in order to connect with the light rail. Table 3-13 compares the future headways by alternative.

Table 3-13
Comparison of Headways for Bus Routes by Alternative, 2035

Route Number	Peak Headway (minutes)		Mid-Day Headway (minutes)		Night Headway (minutes)	
	No-Build	Preferred Alternative	No-Build	Preferred Alternative	No-Build	Preferred Alternative
3	20	20	30	30	45	40
4	30	30	30	30	45	40
11	10	20	10	20	30	40
13	30	30	30	30	30	30
22	30	30	30	30	40	40
23	15	20	30	30	45	40
29	45	40	45	40	---	---
39	35	30	45	30	45	30
54x	12	30	---	60	---	---
80x	20	20	---	---	---	---
110	n/a	30	n/a	30	n/a	60
125	n/a	30	n/a	30	n/a	40
204	30	n/a	30	n/a	60	n/a
211	20	20	20	20	30	40

Notes: "---" refers to no service being operated during those time periods. n/a – Not Applicable; route does not exist in alternative
* Existing UNC Charlotte shuttle routes would also be operated, but are not modeled in the Regional Travel Demand Model.
Source: AECOM and the Metrolina Regional Travel Demand Model, 2011

3.3.1.3 Transfers

Under the No-Build Alternative, transit riders would continue to transfer to/from other bus routes at transit centers. With the Preferred Alternative bus service would be modified to service the light rail stations along the Northeast Corridor. Route schedules would be timed to minimize waiting time in transferring to and from light rail. In addition, the Preferred Alternative would provide a continuous light rail line from the South Corridor to the Northeast Corridor, without requiring a transfer.

3.3.1.4 Transit Travel Times

Under the No-Build Alternative, transit services would continue to travel with general traffic along congested roadways in the Northeast Corridor and would be subject to traffic conditions. Compared to the No-Build Alternative, the Preferred Alternative would demonstrate an advantage in travel time, providing faster service because light rail would operate within a dedicated transit corridor. Table 3-14 provides a comparison of existing (2009) and future (2035) transit travel times.

Table 3-14
Transit Travel Times (minutes) for Selected Trips, AM Peak

Travel Market	2009 Existing Condition	2035 No-Build Alternative	2035 Preferred Alternative
Inbound	**In-Vehicle Time (Weighted Time[1])**		
NoDa to Center City Charlotte	15.5 (34.4)	19.4 (38.3)	9.0 (23.1)
University City to Center City Charlotte	36.6 (59.8)	39.2 (57.2)	18.6 (34.5)
UNC Charlotte to Center City Charlotte	51.4 (83.4)	61.5 (90.8)	25.2 (45.1)
University Research Park to Center City Charlotte	33.9 (60.1)	35.9 (59.9)	29.5 (79.1)
Cabarrus County to Center City Charlotte	88.5 (121.3)	103.8 (130.3)	76.3 (114.9)
UNC Charlotte to NoDa	36.0 (72.6)	42.1 (76.0)	16.3 (38.0)
Outbound	**In-Vehicle Time (Weighted Time[1])**		
Center City Charlotte to NoDa	13.7 (30.6)	14.4 (31.3)	9.0 (23.1)
Center City Charlotte to University City	29.9 (54.1)	31.2 (47.1)	18.6 (34.5)
Center City Charlotte to UNC Charlotte	49.6 (79.6)	56.8 (84.1)	25.3 (45.1)
Center City Charlotte to University Research Park	28.1 (54.4)	27.8 (51.9)	30.7 (85.2)
Center City Charlotte to Cabarrus County	76.9 (124.1)	--- [2]	70.7 (225.5)
NoDa to UNC Charlotte	35.9 (72.6)	42.4 (76.3)	16.3 (38.0)

Notes: [1]Weighted Time = In-Vehicle Time + 1.50*Initial Wait Time + 2.0*Transfer Wait Time + Transfer Penalty + Wtd (Access + Egress + Transfer) Walk. [2] There is no reverse commute AM peak service to Cabarrus County for the 2035 No Build. Therefore there is no transit travel time reported for this travel market.
Source: AECOM and the Metrolina Regional Travel Demand Model, 2011

Table 3-15 shows the comparative auto travel times for selected trips. In 2035, an automobile would take over 37 minutes to travel from UNC Charlotte to Center City Charlotte. Compared to automobile travel times, the Preferred Alternative would result in approximately 12 minutes of travel time savings from UNC Charlotte to Center City Charlotte.

Table 3-15
Auto Travel Times (minutes) for Selected Trips, AM Peak

Selected Trip	2009 Outbound	2009 Inbound	2035 Outbound	2035 Inbound
Center City Charlotte to/from University Research Park	21.9	26.0	25.9	31.3
Center City Charlotte to/from UNC Charlotte	23.0	32.0	28.1	37.1
Center City Charlotte to/from University City	16.0	24.2	19.0	29.0

Source: AECOM and Metrolina Regional Travel Demand Model, 2011

3.3.1.5 Reliability and Safety

Reliability and safety are related to the extent to which transit vehicles operate on an exclusive alignment. The No-Build Alternative would continue to operate in general traffic along existing roadways, subject to congestion and delays associated with traffic conditions, traffic signal delay, accidents and pedestrian crossings. Since the No-Build Alternative would limit transit service to existing roadways, transit service would be less reliable, as service would continue to be interrupted or delayed due to traffic congestion.

The Preferred Alternative would operate on exclusive right-of-way within an existing railroad corridor, within the NCDOT right-of-way along North Tryon Street/US-29, and in a new dedicated easement within the UNC Charlotte campus area. Along the proposed alignment in North Tryon Street/US-29, existing roadway median openings would be eliminated or signalized. There would be no unsignalized crossings of the rail tracks. At major intersections, the light rail line would be grade separated from the roadway in order to minimize traffic disruptions. The tracks would also be grade separated where it enters the median of North Tryon Street/US 29. All other intersection crossings would be at-grade, and include railroad gates/signals and traffic signal pre-emption to control traffic. Since the Preferred Alternative would operate in a dedicated corridor, transit service would increase in respect to both reliability and safety.

3.3.1.6 Comfort

Industry guidelines for evaluating passenger comfort are documented in the *Transit Capacity and Quality of Service Manual* (TCQSM, 2nd Edition, 2003). The manual recommends using a level of service (LOS) to evaluate passenger comfort using the predicted transit vehicle passenger loads. For this purpose, a LOS is defined based on the area available to each standing passenger in the maximum load section; the location on the line where the most passengers will be on-board the train. The manual recommends a LOS of "D" or better is recommended for achieving a comfortable passenger loading level.

For the No-Build Alternative, projected peak loads in the forecast year 2035 were identified for the existing portion of the LYNX Blue Line. For the existing LYNX Blue Line, the highest projected hourly passenger volume during the peak period in 2035 would occur northbound between Bland and Carson Stations, with approximately 1,849 passengers traveling on that segment during the peak hour. As described previously in Section 3.2.1.2, peak service on the existing line in 2035 would consist of 3-car trains operating at 10-minute headways. Based on this service level and projected demand, the typical standee space over the peak hour will be 0.78 meters squared (m^2) per passenger, which is equivalent to a LOS of "B".

For the Preferred Alternative, peak loads were identified in both directions of the LYNX Blue Line during the peak hour. The highest hourly passenger volume northbound during the peak period in 2035 would occur between Carson and Stonewall Stations, with 1,892 passengers traveling on that segment. The highest hourly volume southbound during that same period would occur between Parkwood and 9th Street Stations, with 2,222 passengers traveling on that segment. As described in Section 3.2.1.2, the Preferred Alternative would operate every 10-minutes during the peak period with 3-car trains. Based on this service level and projected demand, the typical standee space over the peak hour will be 0.49 m^2 per passenger, which is equivalent to a LOS of "D".

3.3.1.7 Transit Ridership

The measures used to indicate the impact of the alternatives on transit ridership include:

- Total number transit trips by trip purpose;
- Change in transit trips;
- Peak hour riders on light rail;
- Daily number of boardings by station; and,
- Special event ridership.

Total and New Transit Trips

The Preferred Alternative is intended to provide additional transit opportunities to the residents of Charlotte and the surrounding area. The trips shown in Table 3-16 represent the number of linked trips in the region. A linked trip is a trip from an origin to a destination, regardless of the number of transfers.

The No-Build Alternative is projected to attract 97,595 transit linked trips in 2035. The Preferred Alternative would increase daily transit ridership substantially, attracting 113,541 transit linked trips. As compared to the No-Build Alternative, 15,946 additional riders would utilize transit under the Preferred Alternative. Approximately 45 percent of the projected transit trips for the Preferred Alternative would be home-based work trips and 50 percent of all projected for transit trips for the Preferred Alternative would occur during the peak time period.

Table 3-16
Daily Transit Trips by Purpose, 2035

Trip Purpose	No-Build Alternative	Preferred Alternative
HBW Peak	28,737	33,526
HBW Off-Peak	15,867	18,121
HBO Peak	11,593	13,258
HBO Off-Peak	21,987	24,673
NHB Peak	5,182	6,077
NHB Off-Peak	8,767	10,525
HBU Peak	2,699	3,718
HBU Off-Peak	2,762	3,643
Total Transit Linked Trips	**97,595**	**113,541**

Source: AECOM and Metrolina Regional Travel Demand Model, 2011

Transit Mode Share

Determining the share of transit trips provides insight on the shift from automobiles to transit. Compared to the No-Build Alternative, the Preferred Alternative results in an increase in transit person-trips and a decrease in overall highway persons-trips for the region as shown in Table 3-17.

Table 3-17
Comparison of Total Trips by Mode, 2035

	Daily Person-Trips	
	No-Build Alternative	Preferred Alternative
Total Transit Person-Trips	97,595	113,541
Total Highway Person-Trips	13,247,743	13,232,062
Total Non-Motorized Person Trips (Walk/Bike)	232,325	232,061
Total Person-Trips	13,577,664	13,577,664

Source: AECOM and the Metrolina Regional Travel Demand Model, 2011

Bus Ridership

Under the No-Build Alternative, bus routes in the Northeast Corridor are projected to carry 21,472 weekday riders. The Preferred Alternative would result in a decrease of 5,564 less weekday bus riders over the No-Build Alternative. This slight decrease is a result of some bus riders shifting from buses to light rail. Table 3-18 shows the 2035 projected bus riders (unlinked trips) for each alternative. Unlinked passenger trips count each boarding as a separate trip regardless of transfers.

Table 3-18
Northeast Corridor Bus Ridership Summary by Alternative, 2035

Route Name	2035 Average Weekday Ridership	
	No-Build	Preferred Alternative
Route 3 – The Plaza	2,053	1,217
Route 4 – Country Club	435	776
Route 11 – North Tryon	7,883	1,389
Route 13 – Nevin Road	1,199	1,631
Route 22 – Graham Street	1,500	956
Route 23 – Shamrock	3,214	2,508
Route 29 – UNC Charlotte/South Park	2,037	2,268
Route 39 – Eastway Drive	539	1,174
Route 54x – University Research Park	1,001	330
Route 80x – Concord Express	249	323
Rout 110 – Concord Mills Mall	n/a	1,247
Route 125 – Derita / Prosperity Church	n/a	1,224
Route 204 - LaSalle	498	n/a
Route 211 - Hidden Valley	862	866
Total Average Weekday Bus Ridership	**21,472**	**15,908**

Source: AECOM and the Metrolina Regional Travel Demand Model, 2011
Notes: Route 204 is combined with 23 in Preferred Alternative; 110 and 125 are new routes in Preferred Alternative
*Existing UNC Charlotte shuttle routes would also be operated, but are not modeled in the travel demand model.

Fixed Guideway Ridership

Fixed guideway ridership refers to boardings specifically on the light rail system. The passengers boarding the trains would arrive at stations either by walking, driving or by taking a bus. For the No-Build Alternative, approximately 26,704 riders would use the existing LYNX Blue Line light rail service in 2035. Under the Preferred Alternative, approximately 24,800 additional riders would use light rail, resulting in a total of 51,513 daily light rail boardings for the entire alignment (South to Northeast).

Daily Station Boardings

Light rail ridership was analyzed for each station's peak and off-peak ridership (10-minute headways), as shown in Table 3-19. Under the Preferred Alternative, six stations in the Northeast Corridor would have daily boardings well over 1,500. Four of those six stations would be major trip destinations: Center City Charlotte, North Davidson (NoDa), University City and the UNC Charlotte campus. The other two stations would be major park-and-ride locations, with the highest projected boardings at University City Blvd. Station with just over 3,000 daily boardings.

Table 3-19
Light Rail Boarding Projections, 2035

Station	No-Build Alternative			Preferred Alternative		
	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
I-485/South Blvd	1,607	878	2,485	1,623	887	2,510
Sharon Rd West	996	661	1,658	1,010	669	1,679
Arrowood	883	958	1,841	897	969	1,866
Archdale	480	517	997	487	524	1,011
Tyvola	1,177	1,321	2,497	1,212	1,365	2,577
Woodlawn	753	1,120	1,873	771	1,143	1,913
Scaleybark	651	842	1,493	656	850	1,506
New Bern	541	716	1,257	573	754	1,327
East-West Blvd.	780	1,015	1,795	864	1,115	1,979
Bland	377	498	875	412	544	956
Carson	342	460	802	454	584	1,038
Stonewall	803	507	1,309	1,335	740	2,075
3rd St. / Convention Center	948	695	1,643	1,269	841	2,110
CTC/Arena	2,010	1,786	3,796	4,029	3,244	7,274
7th Street	1,275	1,107	2,381	2,153	1,652	3,805
9th Street	n/a	n/a	n/a	904	758	1,662
Parkwood	n/a	n/a	n/a	329	456	785
25th Street	n/a	n/a	n/a	265	375	640
36th Street	n/a	n/a	n/a	961	959	1,920
Sugar Creek	n/a	n/a	n/a	1,170	1,095	2,265
Old Concord Road	n/a	n/a	n/a	507	472	979
Tom Hunter	n/a	n/a	n/a	430	537	967
University City Blvd.	n/a	n/a	n/a	1,809	1,201	3,011
McCullough	n/a	n/a	n/a	274	452	726
JW Clay Blvd.	n/a	n/a	n/a	1,455	964	2,419
UNC Charlotte	n/a	n/a	n/a	1,172	1,339	2,512
Total	**13,621**	**13,082**	**26,704**	**27,021**	**24,492**	**51,513**

Source: AECOM and the Metrolina Regional Travel Demand Model, 2011

Peak Hour Line Volumes

Table 3-20 shows the projected peak hourly passenger loads for light rail. The peak hourly passenger load is the maximum number of passengers that travel past a single point on a route during the peak hour. As shown in Table 3-20, the highest line volume in the southbound direction would occur between Parkwood and 9th Street Stations, where trains would carry 2,222 annual passengers during the a.m. peak hour. During the same time in the northbound direction, the maximum loading would occur between Carson and Stonewall Stations. A total of 1,892 riders would ride the northbound trains on this section of the line. As noted earlier, the light rail operating plan calls for running three-car trains on ten-minute headways during the peak hours. This would provide one-way hourly carrying capacity of 2,520 passengers per hour per direction, which should provide adequate capacity to handle the projected peak hourly demand.

Table 3-20
Light Rail AM Peak Hour Directional Loads, 2035

Station	No-Build Alternative		Preferred Alternative	
	Northbound	Southbound	Northbound	Southbound
I-485/South Blvd	668	0	673	0
Sharon Rd West	987	103	996	106
Arrowood	1,146	184	1,156	190
Archdale	1,255	254	1,267	264
Tyvola	1,427	268	1,443	280
Woodlawn	1,561	381	1,579	406
Scaleybark	1,745	420	1,761	452
New Bern	1,825	424	1,845	460
East-West Blvd.	1,808	433	1,841	480
Bland	1,842	447	1,877	521
Carson	1,849	487	1,892	576
Stonewall	1,531	512	1,586	645
3rd St. / Convention Center	1,103	482	1,200	863
CTC/Arena	544	459	834	963
7th Street	0	68	433	1,603
9th Street	n/a	n/a	305	2,118
Parkwood	n/a	n/a	294	2,222
25th Street	n/a	n/a	289	2,132
36th Street	n/a	n/a	319	2,063
Sugar Creek	n/a	n/a	344	1,828
Old Concord Road	n/a	n/a	359	1,443
Tom Hunter	n/a	n/a	391	1,303
University City Blvd.	n/a	n/a	431	1,219
McCullough	n/a	n/a	384	629
JW Clay Blvd.	n/a	n/a	383	640
UNC Charlotte	n/a	n/a	0	180

Source: AECOM and the Metrolina Regional Travel Demand Model, 2011

Light Rail Passenger Mode of Access

For the Preferred Alternative, approximately 15 percent would drive to a park-and-ride, 21 percent of riders would take a bus to a station, 58 percent would walk to a station and six percent would be dropped off (kiss-and-ride). The high percentages of riders who would walk to a station reflect destination stations, such as Center City Charlotte and UNC Charlotte, as well as stations where park-and-ride facilities are not available.

In the Northeast Corridor, the University City Blvd. Station would serve the largest number of patrons driving to a station due to the proximity of I-85, with 1,765 drive access riders. The Sugar Creek Station would have the second highest demand for park-and-ride access with a projected drive access demand of 926 riders.

Special Event Ridership

In addition to the trip purposes discussed above, the light rail service is expected to serve a number of special events in the Center City Charlotte and at UNC Charlotte, which are not captured in the ridership projections presented above. The Preferred Alternative is expected to carry an additional 900,447 riders for special events by 2035, including events at the Bank of America stadium (NFL Carolina Panthers), Time Warner Cable Area (NBA Charlotte Bobcats and AHL Charlotte Checkers hockey), the future Charlotte Knights Baseball Stadium in Center City Charlotte, Charlotte Convention Center and NASCAR Hall of Fame, as well as other Center City Charlotte events and UNC Charlotte football. This projected ridership also includes students traveling between the UNC Charlotte Center City campus and its main campus.

3.3.2 Impacts to Streets and Highways

The alternatives considered would have some level of impact to the local and regional roadway network within the Northeast Corridor. The No-Build Alternative relies primarily on street improvements to address projected travel demand, while the Preferred Alternative encourages shifts from automobile to transit. This modal shift may be effective at reducing the growth of congestion on a regional scale. However, because light rail encourages concentrations of higher density development near its stations, local traffic impacts adjacent to stations may result. This section details the regional and local impacts of these alternatives on the transportation system.

3.3.2.1 Systems Performance

Table 3-21 provides a comparison of 2035 projected regional automobile travel, summarized by Vehicles Miles Traveled (VMT) and Vehicles Hour Traveled (VHT), for each alternative. The Preferred Alternative would result in 118,997 fewer daily miles traveled and 4,556 fewer vehicle hours traveled on the region's roadways than the No-Build Alternative. On a regional basis this represents a reduction of approximately 0.2 percent.

Table 3-21
Comparison of VMT and VHT, 2035

	2035	
	No-Build Alternative	**Preferred Alternative**
Vehicles Miles Traveled		
VMT Peak	33,970,887	33,896,150
VMT Off-Peak	35,132,512	35,088,252
VMT Daily	69,103,399	68,984,402
Vehicles Hour Traveled		
VHT Peak	1,380,585	1,377,104
VHT Off-Peak	841,404	840,328
VHT Daily	2,221,989	2,217,433
Change from No-Build		
VMT Daily	n/a	-118,997
VHT Daily	n/a	-4,556

Source: AECOM and Metrolina Regional Travel Demand Model, 2011

3.3.2.2 Local Traffic Operations

This section describes existing and projected 2030 traffic conditions for local roadways and intersections, and identifies potential traffic impacts resulting from the Preferred Alternative. These impacts include changes in traffic operations, such as delay, travel time and speed and are based on analysis of the morning and afternoon peak hours. The analysis focused on road/rail crossings and intersections in proximity to the light rail alignment and transit stations. Detailed information can be found in the *Traffic Analysis Report* (April 2011).

Traffic Analysis Methodology

The projection of future roadway volumes and analysis of intersection traffic conditions was based on growth factors derived from the Metrolina 2030 Regional Travel Demand model. These growth factors were calculated by comparing the ratio of future year 2030 model volumes to the base year model volumes. It should be noted that for consistency with the VISSIM and Synchro traffic models developed for the Draft EIS, the traffic analysis continues to use 2030 data in lieu of 2035 data for the Final EIS. Because growth factors and land uses vary significantly over the length of the corridor, the corridor was divided into two distinct segments and an overall growth factor established for each segment. A map illustrating the location of each segment can be found in Figure 3-5. Segment 1 includes rail crossings and intersections from Center City Charlotte north to Owen Boulevard along North Tryon Street/US-29. This segment also includes all intersections analyzed on Sugar Creek Road and Eastway Drive. Segment 2 begins with Tom Hunter Road and runs along North Tryon Street/US-29 to Mallard Creek Church Road.

Table 3-22
Growth Factors

Corridor Segment	Growth Factor
Segment 1 (Center City Charlotte to Owen Boulevard)	1.30
Segment 2 (Tom Hunter Road to Mallard Creek Church Road)	1.25

Source: *Charlotte Department of Transportation and Metrolina Regional Travel Demand Model, 2011*

Traffic volumes used in the analysis of 2030 conditions resulted from taking 2008 base year counted traffic and multiplying that by the growth factors shown in Table 3-22. The base year volumes were obtained from routine counts made by CDOT and by counts made specifically for this project in 2008 and 2009. The 2030 No-Build volumes simply reflect the application of these growth factors to 2008 base year traffic counts. The 2030 Preferred Alternative volumes reflect a similar application of growth factors, but also include the addition of traffic generated by park-and-ride stations. Build year volumes were also adjusted to account for the redistribution of traffic expected as a result of project-related roadway and access changes.

Synchro 7.0 was used to estimate capacity conditions at all intersections within the study area and was also used to determine LOS for locations where light rail operations would not directly affect traffic flow. Where light rail and vehicular traffic would interact, VISSIM 5.3 (a traffic simulation program capable of modeling light rail and vehicular traffic) was used instead. VISSIM provided estimates of vehicle delay, vehicle queuing and spillback, as well as travel times and speeds; and was used to quantify the benefits and impacts to traffic flow if light rail crossings were made at-grade or were grade separated. VISSIM results for intersections inside the North Tryon Street/US-29 corridor, between Sugar Creek Road and Mallard Creek Church Road can be found in the *Traffic Analysis Report* (April 2011).

Roadway Modifications

The Preferred Alternative would include the roadway modifications as described in Section 2.3.3.4 in Chapter 2.0: Alternatives Considered. For the Preferred Alternative, the proposed light rail alignment travels within an existing railroad right-of-way and the median of North Tryon Street/US-29. Roadway modifications inside the railroad right-of-way as a result of the proposed project include a bridge extension of the Eastway Drive overpass, the depression of 36th Street under the existing and future railroad tracks and the proposed light rail tracks, and crossing improvements at street/rail crossings.

An NCDOT project to grade separate Sugar Creek Road from the existing and future railroad tracks is planned as part of NCDOT's Charlotte Railroad Improvement and Safety Program (CRISP). NCDOT is also proposing to close Craighead Road as part of this project. The LYNX BLE Preferred Alternative would also be grade separated at Sugar Creek Road. The current design of the LYNX BLE Preferred Alternative assumes that the road would be depressed under the railroad. However, NCDOT is evaluating both an underpass and an overpass design. Due to the fact that the horizontal and vertical alignment of the Preferred Alternative would be the same in either case, the impacts of the LYNX BLE Preferred Alternative are not expected to be significantly different.

The majority of the roadway modifications would occur where the Preferred Alternative is situated in the median of North Tryon Street/US-29. North Tryon Street/US-29 would be rebuilt to a complete urban street that accommodates light rail, buses, automobiles, pedestrians and bicyclists. A six-lane typical section with turn lanes is proposed along North Tryon Street/US-29 between Orchard Trace Lane and Shopping Center Drive. The Preferred Alternative would add a northbound through lane that starts north of Orchard Trace Lane and drops at University City Boulevard/NC 49 as one of two right turn lanes. An additional southbound through lane would start just north of Shopping Center Drive and drop at the I-85 Connector as one of two right turn lanes. The remainder of the project would provide four through travel lanes along North Tryon Street/US 29. Left turn lanes would be provided at all signalized intersections and right turn lanes would be provided at select locations. Street features would include median refuge areas, pedestrian crossing signals, multi-use paths, planting strips and bicycle lanes in station areas.

In addition to upgrading the street features of North Tyron Street/US-29, there would also be several changes to roadway access and traffic control. For safety reasons, traffic and pedestrian movements across the light rail tracks must be controlled by traffic signals and railroad crossing signals/gates. This

necessitates closing median openings at midblock locations and at some local side-streets. Where medians are closed, access would be limited to right-in/right-out traffic movements and pedestrian crossings of North Tryon Street/US-29 would be restricted. Median openings would remain at all existing signalized intersections. Since cross-access and street connectivity are vital transportation components to sustaining neighborhoods and businesses adjacent to North Tryon Street/US-29, the Preferred Alternative would include five new signalized intersections along North Tryon Street/US-29. Four median openings would be closed along North Tryon Street/US-29. Design and construction of the Preferred Alternative would not preclude the subsequent opening of a median at Hampton Church Road or a median at a future street located in the vicinity of Stetson Drive. Tables 3-23 and 3-24 summarize existing and proposed median openings along North Tryon Street/US-29. Figures 3-6a through 3-6c depict the proposed intersection design and at-grade crossings for the Preferred Alternative.

Table 3-23
North Tryon Street/US-29 Summary of Median Openings

	Old Concord Road to UNC Charlotte Research Drive	
	Existing	Preferred Alternative
Signalized	11	16
Unsignalized	9	0

Table 3-24
North Tryon Street/US-29 Median Opening Locations

Intersection	Existing	No-Build	Preferred Alternative
Old Concord Road	Signalized	Signalized	Signalized
Orr Road	Unsignalized	Signalized	Signalized
Austin Drive	Unsignalized	Unsignalized	Closed
Arrowhead Road	Unsignalized	Signalized	Signalized
Heathway Drive	Unsignalized	Unsignalized	Closed
Owen Boulevard	Unsignalized	Unsignalized	Signalized
Tom Hunter Road	Signalized	Signalized	Signalized
Midblock (Post Office Driveway)	Unsignalized	Unsignalized	Closed
Orchard Trace Lane	Unsignalized	Unsignalized	Signalized
Reagan Drive/Kemp Street*	Unsignalized	Closed	Closed
I-85 Connector	Signalized	Signalized	Signalized
University City Blvd. Station Access	n/a	n/a	Signalized
Stetson Drive*	Unsignalized	Closed	Closed
University City Blvd.	Signalized	Signalized	Signalized
Shopping Center Drive	Signalized	Signalized	Signalized
Clark Boulevard	Unsignalized	Unsignalized	Closed
McCullough Drive	Signalized	Signalized	Signalized
Midblock (NC Highway Patrol Driveway)	Unsignalized	Unsignalized	Closed
Ken Hoffman Drive	Signalized	Signalized	Signalized
WT Harris Boulevard	Signalized	Signalized	Signalized
JM Keynes Drive	Signalized	Signalized	Signalized
JW Clay Boulevard	Signalized	Signalized	Signalized
UNC Charlotte Research Drive	Signalized	Signalized	Signalized

* Median opening is eliminated with Weave reconstruction project
n/a – Not Applicable; Intersection does not exist under Existing Conditions or No Build Alternative.

Other roadway and rail improvements that would change traffic patterns in the corridor include:

- The Old Concord Road and North Tryon Street/US-29 intersection would be re-configured, and would include a grade separated bridge for the light rail alignment to access the median of North Tryon Street/US-29.
- North Tryon Street/US-29 & Orr Road – A fourth leg is assumed to be added in the future (as a separate project) to the intersection under the Preferred Alternative. The additional eastbound Orr Road approach would restore connectivity for residents on the west side of North Tryon Street/US-29 that would be lost with the proposed turning restrictions at Austin Drive.

- Driveways to access station park-and-ride facilities would be constructed along Sugar Creek Road, North Tryon Street/US-29 and Old Concord Road.
- The light rail alignment would be constructed to cross under the northbound travel lanes of North Tryon Street/US-29 just north of the UNC Charlotte Research Drive intersection in order to access the campus and the UNC Charlotte station.

Intersection Level of Service

An analysis of over 55 intersections was conducted to determine the effects that the Preferred Alternative and the design option would have on traffic operations within the corridor. This analysis consisted of estimating intersection capacity usage for all intersections and alternatives under study, as well as determining vehicular level of service (LOS) at those intersections. Capacity usage is reported in terms of a volume to capacity ratio (V/C), and level of service is reported based on the average vehicle delay experienced at an intersection. Volume to capacity ratios that are close to or that exceed 1.0 are indicative of congested traffic conditions. Level of service is a qualitative measure of traffic flow intended to reflect driver discomfort and frustration, with a criteria range of A to F. LOS A through D represent what is generally considered to be acceptable motorist delays, with LOS D approaching unstable traffic flows that might result in motorists waiting through more than one signal cycle. LOS E and F reflect congested to extremely congested traffic conditions. The results of this analysis of intersection operations can be found in the *Traffic Analysis Report* (April 2011).

Table 3-25 summarizes the intersection operations for signalized intersections under the No-Build Alternative and Preferred Alternative. There would be decreases in the LOS and increases in delay at several signalized intersections along North Tryon Street/US-29 as the result of the construction of the Preferred Alternative. Twelve intersections would operate at a LOS E or LOS F in the No-Build scenario and would experience an increase in delay with the Preferred Alternative; these would include the Sugar Creek Road, Eastway Drive, Old Concord Road, Orr Road, Owen Boulevard, Tom Hunter Road, Orchard Trace Lane, I-85 Connector, University City Blvd./NC-49, Shopping Center Drive, W.T. Harris Boulevard and Mallard Creek Church Road intersections.

Three signalized intersections along North Tryon Street/US-29 would decrease from a LOS D under the No-Build Alternative to a LOS E or LOS F with the Preferred Alternative as follows:

- At W.T. Harris Boulevard, congestion would increase as a result of the additional traffic going to the nearby park-and-ride facilities. The light rail would be grade-separated, so light rail operation itself would not affect this signalized intersection.
- Traffic volumes would increase on the northbound through movement at the North Tryon Street/US-29 and McCullough Drive intersection due to traffic exiting nearby park-and-ride facilities. The increase in traffic and light rail preemption would increase the delay on North Tryon Street/US-29.
- At the intersection of North Tryon Street/US-29 and JW Clay Boulevard, traffic volumes would increase due to traffic accessing the adjacent park-and-ride facility for the light rail station. The existing northbound dual left turn lane would be replaced with a single left to reduce the crossing distance for pedestrians accessing the light rail station. This also contributes to the increase in delay.

The operations at most unsignalized intersections along North Tryon Street/US-29 would improve as a result of the access changes proposed with the Preferred Alternative. These changes would only allow traffic to turn right onto North Tryon Street/US 29 from the side streets; left turns and through movements across the tracks would be prohibited by a median. There are a few unsignalized intersections that would not improve or would experience a decreased LOS as a result of their close proximity to congested signalized intersections.

Of the unsignalized intersections beyond the limits of North Tryon Street/US-29, only one would experience a decrease from a LOS D or better to a LOS E or LOS F. This would be at the northern Raleigh Street and Sugar Creek Road intersection. Delays would occur during the p.m. peak hour on the eastbound Raleigh Street approach due to vehicles exiting the Sugar Creek Station park-and-ride facilities. The Sugar Creek Station would have two park-and-ride lots. The traffic analysis assumed: a connection between Raleigh Street and Greensboro Street through the Sugar Creek Station northern parking lot; left turns would be restricted from Sugar Creek Road onto westbound Raleigh Street and vice

versa (for safety and operational reasons); and a driveway on Sugar Creek Road for the northern parking lot with turning restrictions for exiting traffic. These assumptions are subject to change based on the future Sugar Creek Grade Separation Project.

Subsequent to the development of this analysis, an NCDOT project (STIP I-3803) has been identified to widen approximately 13 miles of I-85 from US-29/NC-49 in Mecklenburg County to NC 73 in Cabarrus County. When built, this project can benefit travel along North Tryon Street/US 29 by diverting some inter-county traffic from North Tryon Street/US 29 to I-85. The effects of the I-85 widening project were not included in this analysis.

Table 3-25
Signalized Intersections, Delay and Level of Service, 2030

Intersection	No-Build Alternative				Preferred Alternative			
	Delay (sec.)		LOS		Delay (sec.)		LOS	
	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.
12th Street & College Street	9.7	14.7	A	B	9.8	14.7	A	B
36th Street & North Davidson Street	8.8	11.1	A	B	8.8	11.1	A	B
Sugar Creek Road & Greensboro Street	3.9	9.9	A	A	5.5	17.7	A	B
North Tryon Street/US-29 & Sugar Creek Road	132.9	105.9	F	F	117.8	142.3	F	F
North Tryon Street/US-29 & Eastway Drive	32.7	96.2	C	F	25.9	109.6	C	F
Eastway Drive & Northpark Mall Driveway #2	3.3	7.4	A	A	2.8	7.6	A	A
North Tryon Street/US-29 & Old Concord Road[#]	56.2	23.4	E	C	61.8	36.4	E	D
Old Concord Road & Orr Road	62.0	37.5	E	D	46.0	29.5	D	C
North Tryon Street/US-29 & Orr Road[@]	55.6	27.0	E	C	68.1	25.3	E	C
North Tryon Street/US-29 & Arrowhead Drive[@]	23.9	17.6	C	B	41.8	24.1	D	C
North Tryon Street/US-29 & Tom Hunter Road	19.1	135.7	B	F	29.2	145.7	C	F
North Tryon Street/US-29 & I-85 Connector[#]	41.6	189.8	D	F	42.0	289.3	D	F
North Tryon Street/US-29 & University City Blvd./NC-49[#]	118.6	196.1	F	F	101.6	277.1	F	F
North Tryon Street/US-29 & Shopping Center Drive	27.6	65.2	C	E	32.7	195.8	C	F
North Tryon Street/US-29 & McCullough Drive	15.6	36.3	B	D	16.8	220.7	B	F
North Tryon Street/US-29 & Ken Hoffman Drive	16.5	12.6	B	B	19.7	97.3	B	F
North Tryon Street/US-29 & W.T. Harris Boulevard[##]	50.5	185.6	D	F	70.4	340.2	E	F
North Tryon Street/US-29 & JM Keynes Drive	10.8	24.8	B	C	26.2	137.9	C	F
North Tryon Street/US-29 & JW Clay Boulevard	17.1	38.5	B	D	29.8	154.3	C	F
North Tryon Street/US-29 & UNC Charlotte Research Drive	11.5	27.6	B	C	28.1	192.4	C	F
North Tryon Street/US-29 & Mallard Creek Church Road	68.2	104.3	E	F	56.8	169.1	E	F

Source: *LYNX Blue Line Extension Northeast Corridor Light Rail Project; Traffic Analysis Report, April 2011*
[@] Note: Intersection is anticipated to be signalized by 2030
[#] Note: Assumes the light rail alignment is grade separated over the intersection

Light Rail Grade Crossing Analysis

The Preferred Alternative would operate in two main environments; the railroad right-of-way and the North Tryon Street/US-29 median. The proposed alignment would cross numerous side streets in both areas. Two options exist when the light rail traverses a side street or crosses traffic to enter/exit a highway median. One option is to grade separate the crossing and the other option is to keep the crossing at-grade. An at-grade crossing would position the light rail tracks at the same elevation as the existing roadway and vehicular crossings of the light rail line would be controlled by traffic lights and gates. A grade separated crossing would construct the light rail above or below the existing roadway so that the light rail and vehicular traffic do not impede one another.

Recommendations for grade separated and at-grade crossings were based on safety, traffic volumes, transit headways, arterial travel speeds, cost, intersection delays and traffic spillback to adjacent intersections. As a result of the traffic impacts identified through this analysis, major intersections as well as the light rail entry into and exit from the North Tryon Street/US-29 median would be grade separated. All other crossings would be at-grade. While the at-grade crossings would experience increased delays on side streets and left turn crossings of the light rail line, the proposed project would use advanced traffic control strategies to manage these impacts. Table 3-26 provides a summary of the rail crossing recommendations for the Preferred Alternative.

Table 3-26
Preferred Alternative Rail Crossing Summary

Street	Crossing	Recommendation	Traffic Control
7th Street	midblock	at-grade	gates and flashers
8th Street	midblock	at-grade	gates and flashers
9th Street	midblock	at-grade	gates and flashers
10th Street (proposed)	midblock	at-grade	gates and flashers
11th Street	midblock	existing grade separation	none
I-277	interstate	existing grade separation	none
12th Street	midblock	at-grade	gates and flashers
CSX Railroad	railroad	grade separate	none
16th Street	midblock	at-grade	gates and flashers
Entrance to Vehicle Storage Yard (proposed)	midblock	at-grade	gates and flashers
30th Street	midblock	existing grade separation	none
Duke Energy Access Road (proposed)	midblock	grade separate	none
AC&W Railroad	railroad	grade separate	none
36th Street	midblock	grade separate	none
East Craighead Road	midblock	grade separate	none
Sugar Creek Road	midblock	grade separate	none
Eastway Drive	midblock	existing grade separation	none
Old Concord Road Station Park-and-Ride Access Road	midblock	at-grade	gates and flashers
North Tryon Street/US-29 median entrance	intersection/ median entrance	grade separate	signal
Orr Road	intersection	at-grade	signal, gates and flashers
Arrowhead Drive	intersection	at-grade	signal, gates and flashers
Owen Boulevard	intersection	at-grade	signal, gates and flashers
Tom Hunter Road	intersection	at-grade	signal, gates and flashers
Orchard Trace Lane	intersection	at-grade	signal, gates and flashers
I-85 Connector	intersection	grade separate	
University City Blvd. Station Park-and-Ride Access Road	intersection	at-grade	signal, gates and flashers
University City Blvd./NC-49	intersection	grade separate	signal
Shopping Center Drive	intersection	at-grade	signal, gates and flashers
McCullough Drive	intersection	at-grade	signal, gates and flashers
Ken Hoffman Drive	intersection	at-grade	signal, gates and flashers
W.T. Harris Boulevard	intersection	grade separate	signal
JM Keynes Drive	intersection	at-grade	signal, gates and flashers
JW Clay Boulevard	intersection	at-grade	signal, gates and flashers
UNCC Research Drive	intersection	at-grade	signal, gates and flashers
North Tryon Street/US-29 median exit	midblock/median exit	grade separate	none

Source: *Traffic Analysis Report Rev. 01, April 2011*. Based on 2008 counts.

3.3.2.3 Effects on Other Transportation Facilities and Services

Parking

Parking facilities outside of Center City Charlotte under the No-Build Alternative would continue to consist of on-street parking or commercial shopping center parking lots. For the Preferred Alternative, park-and-ride lots would be constructed at four station locations. The locations and the total number of provided parking spaces are detailed in Chapter 2.0: Alternatives Considered – Table 2-5: Proposed Stations for the Preferred Alternative. The Light Rail alignment would traverse through the median of North Tryon Street/US-29 and roadway widening would be required. As a result, potential impacts would occur to existing private parking facilities along North Tryon Street/US-29. The civil design plans depict that approximately 30-35 parcels would have their existing parking reduced to some degree. Overall, approximately 375-385 parking spaces would be affected. Many of these parcels have additional space that could be used for relocating the affected parking spaces. Overall, a majority of the existing properties

parking supply along the corridor would not be affected due to efforts in constructing retaining walls along the edge of the proposed right-of-way limits.

Freight Railroads

Under the No-Build Alternative, existing freight rail service would continue to operate in its current location. Recent trends shows that freight rail service would continue to increase due to the higher costs of vehicular fuel.

Under the Preferred Alternative, separate tracks would be built for light rail and the light rail would not cross the existing freight rail tracks at-grade. Therefore, freight service operations would not be altered and potential rail conflicts would be minimized. The proposed project does include relocating existing freight tracks from approximately 30th Street to Craighead Road to make room for the proposed light rail alignment. The grade separation will provide both operational and safety benefits for freight railroads by separating railroad movements from auto, bicycle and pedestrian movements. Tracks would be constructed to be used temporarily by the freight/passenger rail operators during the construction of the Preferred Alternative in order to avoid any construction-related impacts (See Chapter 18.0: Construction). The light rail tracks would cross over existing freight tracks on a grade separated structure near Craighead Road. Whenever the light rail tracks are at-grade with the freight tracks, a 54 foot separation would be maintained between the tracks at all times.

Separate from the proposed project, there are two different freight projects that are in either the planning or design phase. The first one is the relocation of the existing NS Intermodal Yard to the Charlotte-Douglas International Airport. It is anticipated that within the next two years, the intermodal yard will be relocated to the airport to provide quick and easy transfers from air cargo to freight. The second project is being coordinated by NCDOT and NCRR, in which Sugar Creek Road would be depressed or elevated allowing for a new grade separated crossing. The existing freight tracks would not change in elevation, Sugar Creek Road would go under or over the existing tracks.

Passenger Railroads

Under the No-Build Alternative, the existing passenger rail service would operate as it currently does. As mentioned in Section 3.1.4, future passenger rail service accommodating higher speeds is planned to utilize the corridor, which would require additional tracks to be constructed. The proposed high speed rail service would be a separate alignment and would not share tracks with freight service.

Amtrak and NCDOT Rail utilize the existing freight tracks within the corridor for passenger rail service. For the Preferred Alternative, the same conditions would apply as with the freight rail. There would be no conflicts between passenger rail and the light rail service, as well as with future high speed rail. Tracks would be constructed to be used temporarily by the freight/passenger rail operators during the construction of the Preferred Alternative in order to avoid any construction-related impacts (See Chapter 18.0: Construction).

Bikeways and Major Pedestrian Ways

Under the No-Build Alternative, no changes to bikeways or major pedestrian ways would occur beyond those described in Section 3.2.5. Under the Preferred Alternative, existing pedestrian and bicycle facilities would be enhanced. The Preferred Alternative proposes multi-use paths, bicycle lanes, median refuge areas for pedestrians and vehicular speed reductions along North Tryon Street/US-29. These connections would improve bicycle and pedestrian access to the light rail stations and promote connectivity between stations. In Center City Charlotte, a pedestrian path from 9th Street to 12th Street would be constructed parallel to the light rail in order to meet the Uptown Streetscape Ordinance Design Standards. Multi-use paths, for pedestrian and wheelchair accessibility, would be constructed leading up to all station areas.

Additionally, as a result of the City's *Northeast Corridor Bicycle Vision Study*, a 1.2 mile multi-use path was proposed in April 2011. The multi-use path would be constructed parallel to the light rail between the Sugar Creek and Old Concord Road Stations. The path would provide bicycle and pedestrian connectivity to the light rail stations and for maintenance access between stations. A stakeholder/public meeting was conducted on April 27, 2011 to gain input on options to improve bicycle connectivity within the BLE

corridor, including the proposed multi-use path between Sugar Creek and Old Concord Stations. At the meeting, stakeholders and the public voiced strong support for the pathway. A feasibility study was completed in May 2011, and the path was subsequently added to the BLE project. No significant environmental impacts are anticipated.

Other amenities will also be provided to improve the pedestrian and bicycle environment. Bicycle parking would be provided at each station by use of either bicycle lockers and/or lockable stands. Bicycles would also be allowed to be placed in a bike holder in each light rail vehicle or carried into the vehicle. Each bike holder inside the vehicle would have the capability to hold up to two bikes.

The City of Charlotte will also identify improvements beyond station areas as part of a separate program called the Northeast Corridor Infrastructure (NECI) Program. NECI is similar to the City of Charlotte's South Corridor Infrastructure Program (SCIP), where pedestrian, bicycle and other infrastructure improvements were identified and constructed after the decision to implement light rail in the corridor was made.

3.4 Mitigation

The transit capacity provided by the LYNX BLE will enhance the North Tryon Street/US-29 corridor by both increasing the overall person carrying capacity of the corridor and by providing a transit option for north/south trips in the corridor. Long term goals for the corridor couple the proposed light rail project with additional street connectivity to lessen the dependence on the existing major thoroughfares. The improvement of pedestrian and bicycle facilities also plays a critical role in the long term goals for the corridor by promoting walking and cycling, in addition to vehicular travel. As a way to support these other travel modes, the BLE project proposes that a safe and comfortable environment be built along North Tryon Street/US 29 that includes bike lanes, pedestrian crosswalks & signals, pedestrian refuge within medians, and minimized intersection crossing distances (particularly where transit stations are located within the median).

The "Weave Area" Project (currently under construction by the City) installs two signals on North Tryon Street/US-29; one at I-85 Connector and another at University City Boulevard. The proposed Preferred Alternative would signalize five additional intersections on North Tryon Street/US-29; Orr Road, Arrowhead Drive, Owen Boulevard, Orchard Trace Lane, and University City Station Access. With light rail transit running in the median, safety requires traffic signals at all median openings. The location and spacing of median openings reflects an attempt to balance the competing needs of pedestrians, adjacent land uses, traffic circulation and mobility, and light rail operations.

Access and operational improvements were recommended at intersections where impacts have been identified. The recommendations include installation of traffic signals and turn lanes along North Tryon Street/US-29, capacity improvements within the "Weave Area", as well as a reduction in the posted speed limit from 45 mph to 35 mph. The following corridor-level design changes were analyzed in the *Traffic Analysis Report* and are included in the *65% Preliminary Engineering Design Plans*. No additional mitigation is proposed.

- *Sugar Creek Road & Greensboro Street* – Provide exclusive dual left turn lanes and a through/right turn lane for the eastbound Greensboro Street approach.
- *North Tryon Street/US-29 & Old Concord Road* - Provide exclusive dual left turn lanes and a separate right lane for the westbound Old Concord Road approach.
- *North Tryon Street/US-29 & Orr Road* – Provide a second approach lane for Orr Road. This lane can either serve as a through-right lane or as a separate right turn lane. Its use will be determined as the design proceeds. This intersection will be signalized by the project.
- *North Tryon Street/US-29 & Arrowhead Drive* - Remove the existing northbound and southbound right turn lanes on North Tryon Street/US-29. The right turn volume at this intersection is minimal and the removal of these turn lanes do not adversely affect the level of service at this location. This intersection will be signalized by the project.
- *North Tryon Street/US-29 & Owen Boulevard* - Install a traffic signal at this intersection and remove the northbound and southbound right turn lanes on North Tryon Street/US-29. Removal

of these two lanes does not adversely affect the level of service at this location based on existing and projected volumes.

- *North Tryon Street/US-29 & Orchard Trace Lane* - Install a traffic signal at this intersection. A second approach lane on Orchard Trace Lane is also recommended. This lane can either serve as a through-right lane or as a separate right turn lane, depending on whether a fourth leg is eventually added to the intersection. Its use will be determined as the design process proceeds.
- *"Weave Area"* – Add additional lanes on North Tryon Street/US-29. Due to the new terminus at UNC Charlotte and elimination of the two park-and-ride stations formally proposed beyond UNC Charlotte, additional parking needs are accommodated at the University City Blvd. Station. As such, additional lanes along North Tryon Street/US-29 in the "Weave Area" are needed to accommodate the additional projected traffic. One additional thru/right lane in each direction would need to be provided. In the northbound direction, the 3-lane section would run from north of Orchard Trace Lane to University City Boulevard. In the southbound direction, the additional lane would run from Shopping Center Drive to the I-85 Connector.
- *North Tryon Street/US-29 & University City Blvd. Station Access* - Install a traffic signal at this intersection. Provide a northbound left turn lane to access the park-and-ride facility and a southbound left turn lane to permit U-turns.
- *North Tryon Street/US-29 & Shopping Center Drive* – Provide dual left turn lanes for the southbound approach of North Tryon Street/US-29.
- *North Tryon Street/US-29 & McCullough Drive* – Remove one of the dual left turn lanes on the southbound approach of North Tryon Street/US-29. The removal of this turn lane will not adversely impact the level of service for traffic and will in turn provide a shorter crossing distance for transit patrons accessing the station platform. The Preferred Alternative would also remove the northbound right turn lane on North Tryon Street/US-29. The right turn volume at this intersection is minimal and the removal of this lane does not adversely affect the level of service at this location.
- *North Tryon Street/US-29 & Ken Hoffman Drive* – Modify the North Tryon Street/US-29 northbound approach thru/right turn lane to become a dedicated right turn lane.
- *North Tryon Street/US-29 & JW Clay Boulevard* - Remove one of the dual left turn lanes on the northbound approach of North Tryon Street/US-29. Although the removal of this lane will impact the level of service for traffic, it will improve pedestrian access to the station platform by providing a shorter crossing of the street.
- *JW Clay Boulevard & Olmstead Drive/JM Keynes Drive* – Install a traffic signal at this intersection, and modify the JM Keynes approach to allow left turns and through movements that are currently restricted.

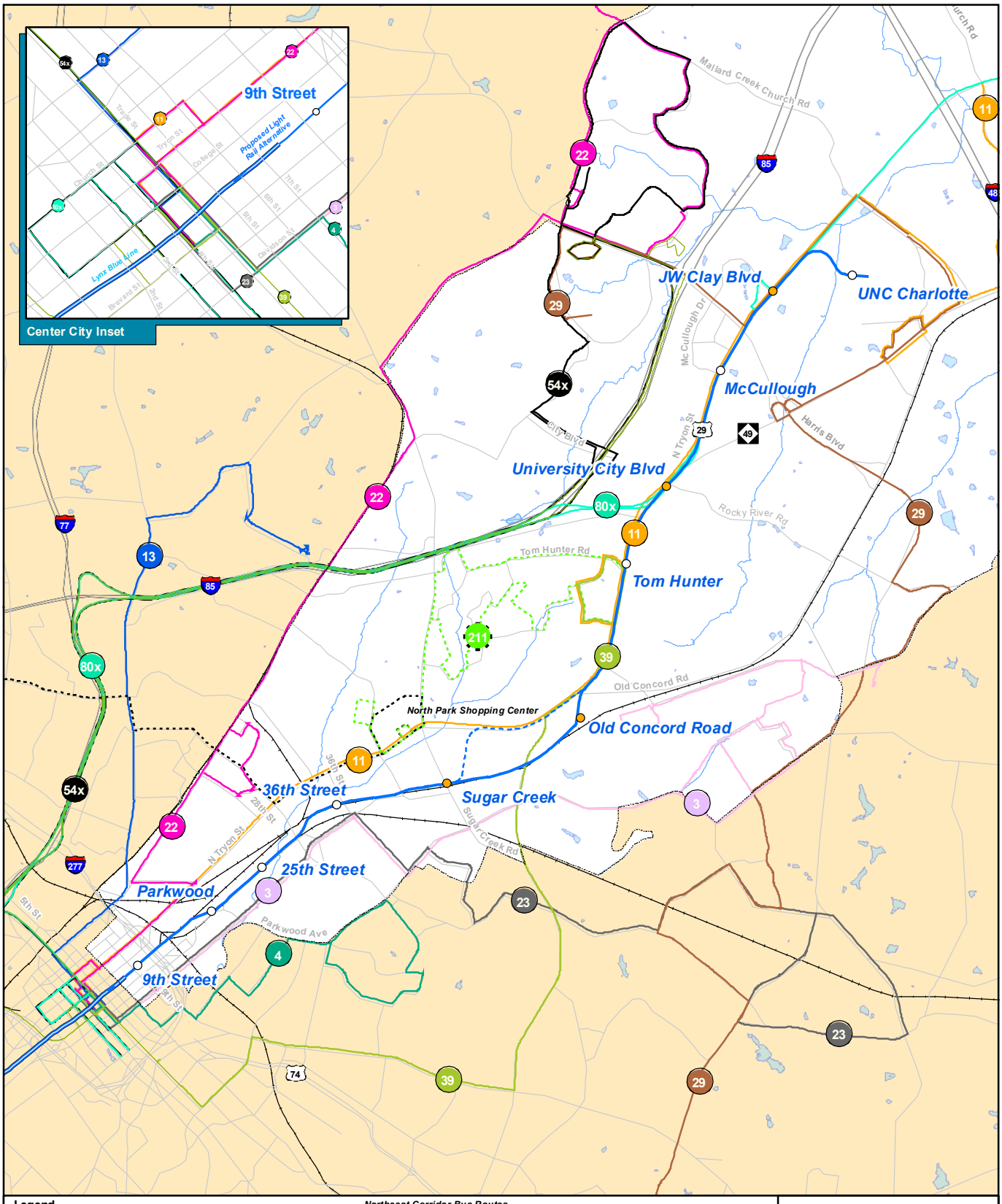
To minimize impacts from light rail operations, the Preferred Alternative proposes that light rail be grade separated with major intersections. These intersections include I-85 Connector, University City Blvd./NC-49 and W.T. Harris Boulevard. Grade separations are also proposed when the light rail alignment enters and exits the North Tryon Street/US-29 median, and at mid-block crossings of 36th Street, Sugar Creek Road and Eastway Drive.

Access management will be facilitated at the four park-and-ride locations through the addition of new driveways to provide access to the stations. In some situations, these access points will be either right-in/right-outs or full movement signalized intersections. Pedestrian and bicycle access to the stations will be facilitated by improvements in the station vicinity. A traffic signal would be added to the intersection of Parkwood Avenue and Brevard Street to allow safe pedestrian crossings to access the Parkwood Station.

Additional design considerations were included in the *65% Preliminary Engineering Design Plans* to avoid railroad conflicts with the light rail. The Preferred Alternative includes a grade separated crossing of the CSX Corporation railroad. In the NCRR right-of-way, the light rail project includes grade separations over the NS and AC&W railroads, along with relocating the NS mainline freight tracks to provide space for the light rail alignment.

LYNX Blue Line Extension

Figure 3-1
Existing Northeast Corridor Bus Network



Legend

- Northeast Corridor Limits
- Proposed Light Rail Alternative
- Design Option
- Proposed Stations
- Proposed Stations with Park-and-Ride
- LYNX Blue Line
- Railroads
- Roads
- Streams
- Waterbodies

Northeast Corridor Bus Routes

- The Plaza
- Country Club
- North Tryon
- Nevins
- Graham St
- Shamrock
- UNC Charlotte
- Eastway
- University Research Park
- Concord
- Lasalle
- Hidden Valley

0 0.5 1 Mile

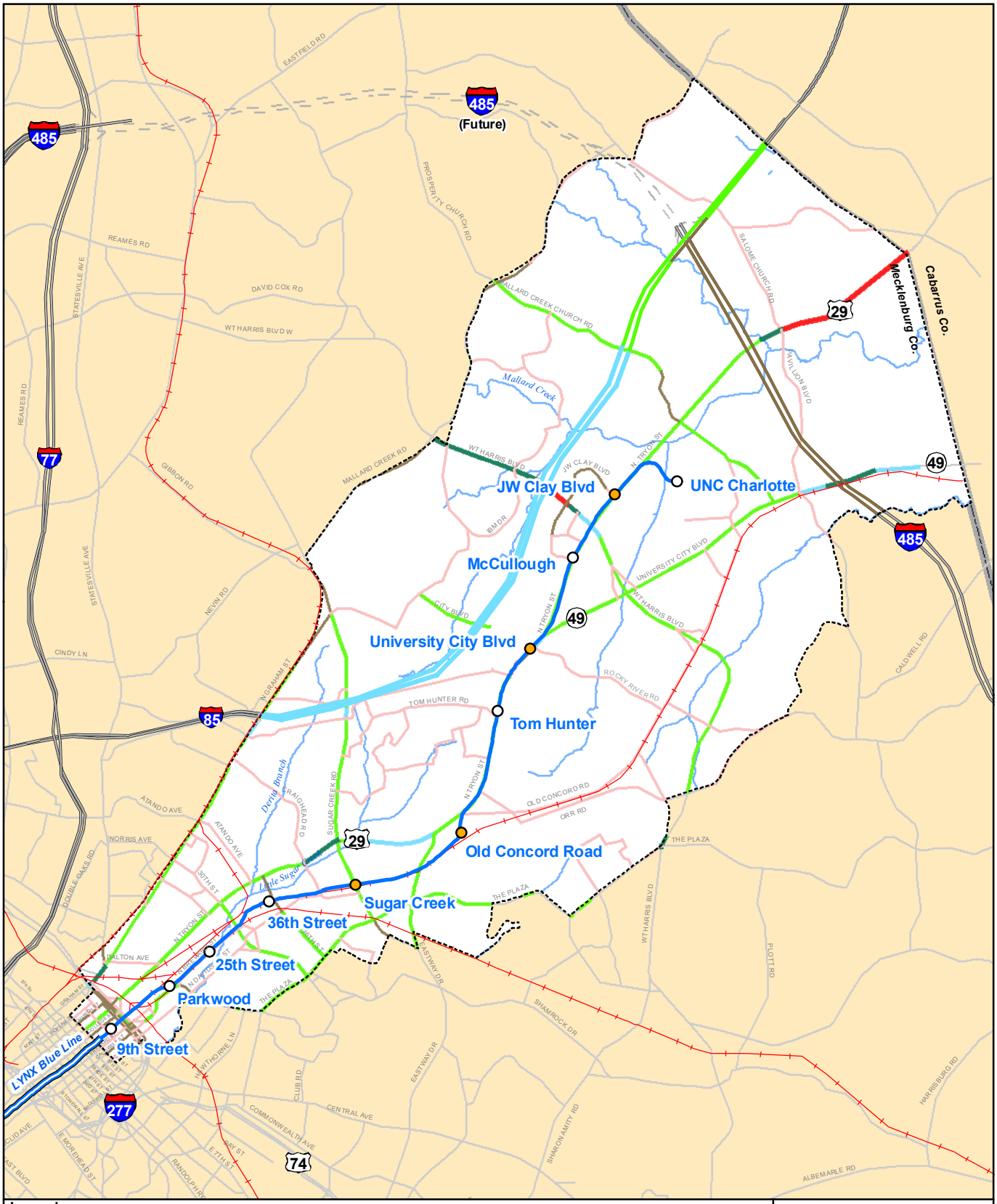
Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

BLE FEIS Figure 3-1.pdf

07/11/11

LYNX Blue Line Extension

Figure 3-2
Major Roads and Railroads Serving the Northeast Corridor



Legend

- Northeast Corridor Limits
- Proposed Light Rail Alignment
- LYNX Blue Line
- Proposed Stations
- Proposed Stations with Park-and-Ride
- Railroads
- Highway
- Roads
- Highway (Future)
- Streams
- County Line

Major Roads # of Lanes

- 2 Lane Road
- 3 Lane Road
- 4 Lane Road
- 5 Lane Road
- 6 Lane Road
- 7 Lane Road
- 8 Lane Road

N

0 0.5 1
Mile

Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

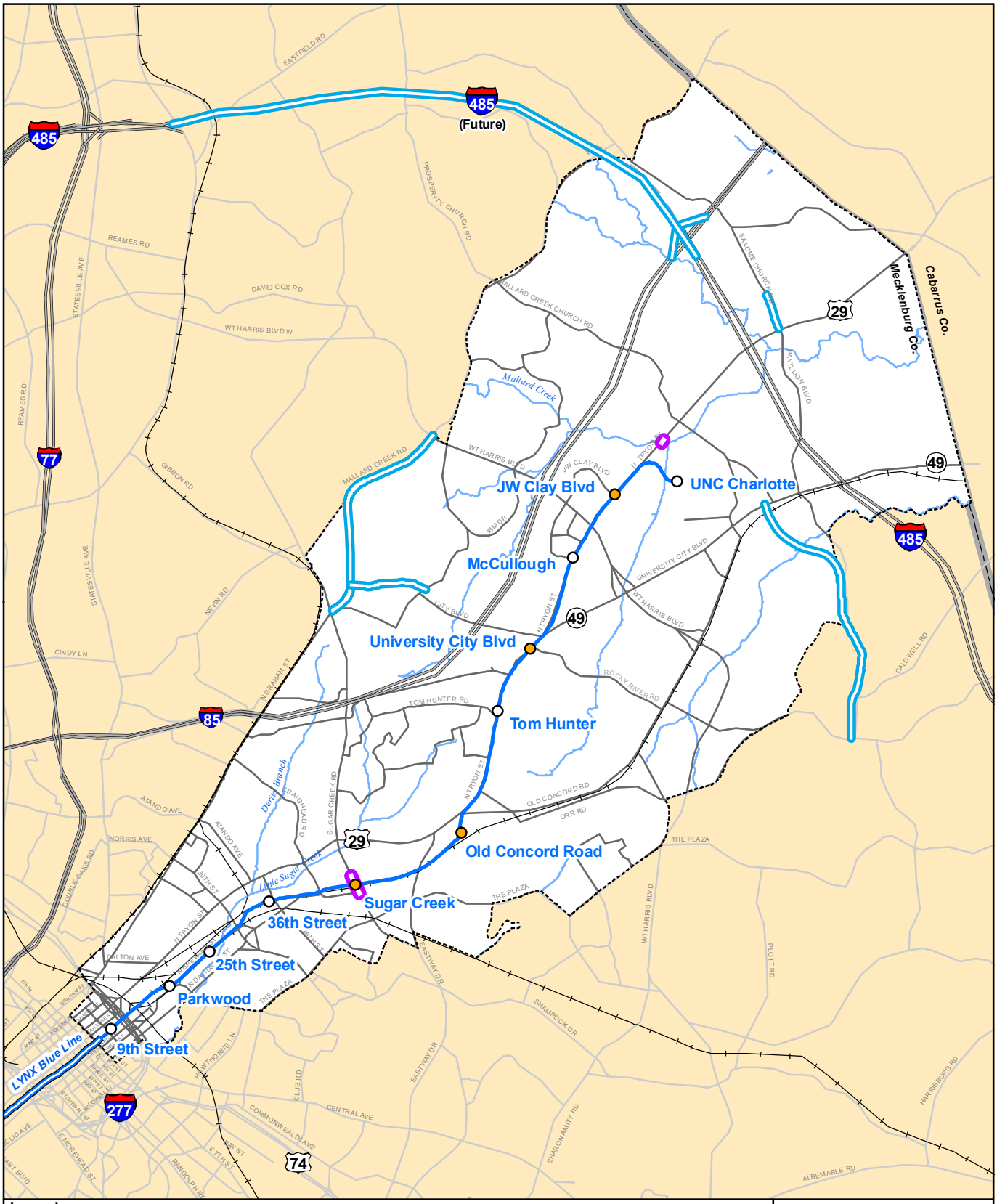
07/11/11

BLE FEIS Figure 3-2.pdf

LYNX Blue Line Extension

Figure 3-3

Planned and Programmed Projects within the Northeast Corridor



Legend

- Northeast Corridor Limits
- Proposed Light Rail Alignment
- LYNX Blue Line
- Proposed Stations
- Proposed Stations with Park-and-Ride
- Railroads
- Highway
- Major Roads
- Highway (Future)
- Streams
- County Line
- Roadway Improvements by 2015 (TIP)
- Roadway Improvements by 2035 (LRTP)

N

0 0.5 1

Mile

Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

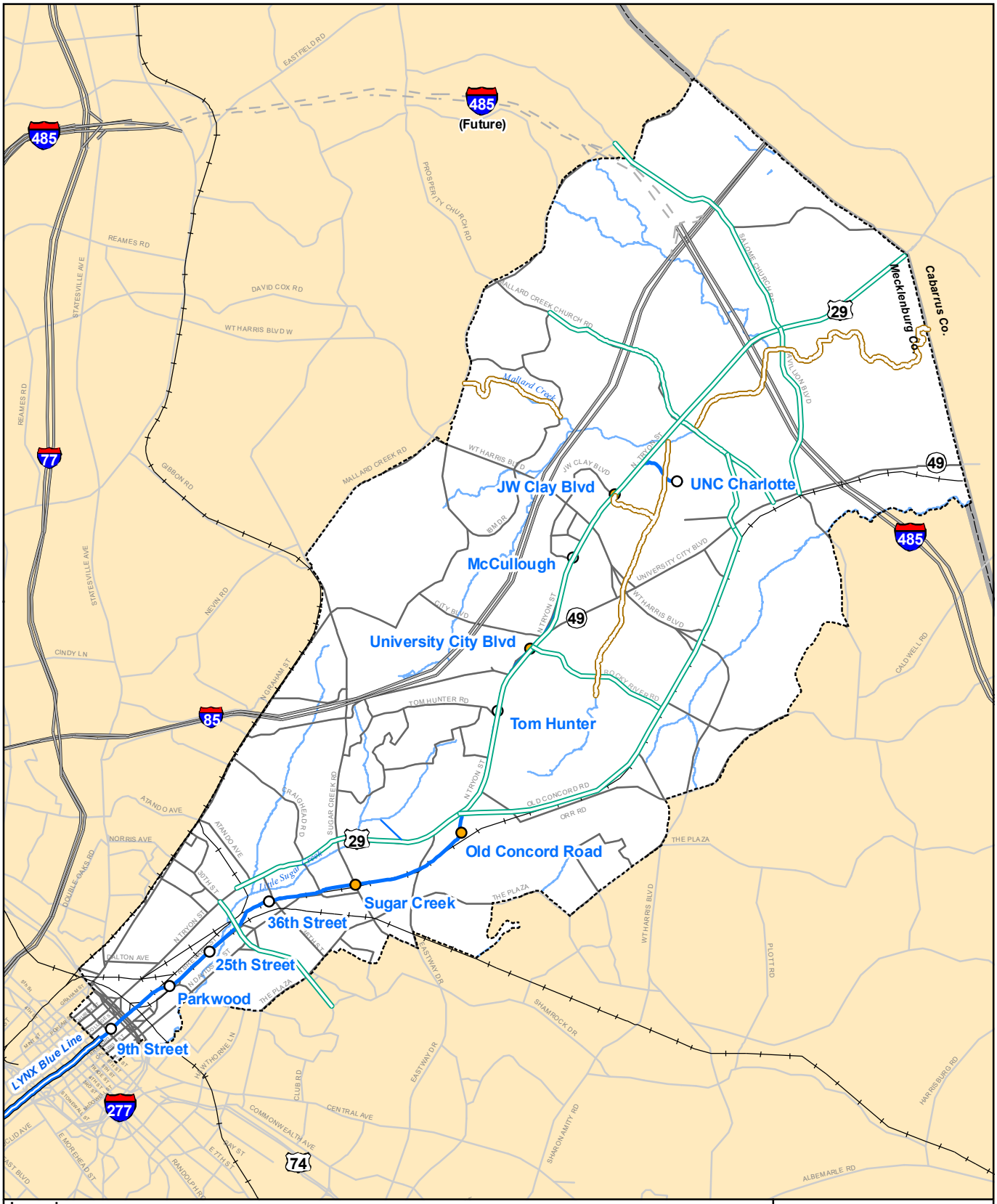
07/11/11

BLE FEIS Figure 3-3.pdf

LYNX Blue Line Extension

Figure 3-4

Bikeway Improvements within the Northeast Corridor



Legend

- Northeast Corridor Limits
- Proposed Light Rail Alignment
- LYNX Blue Line
- Proposed Stations
- Proposed Stations with Park-and-Ride
- Railroads
- Highway
- Major Roads
- Highway (Future)
- Streams
- County Line
- Bikeway Improvements
- Off-Road Trail

N

0 0.5 1

Mile

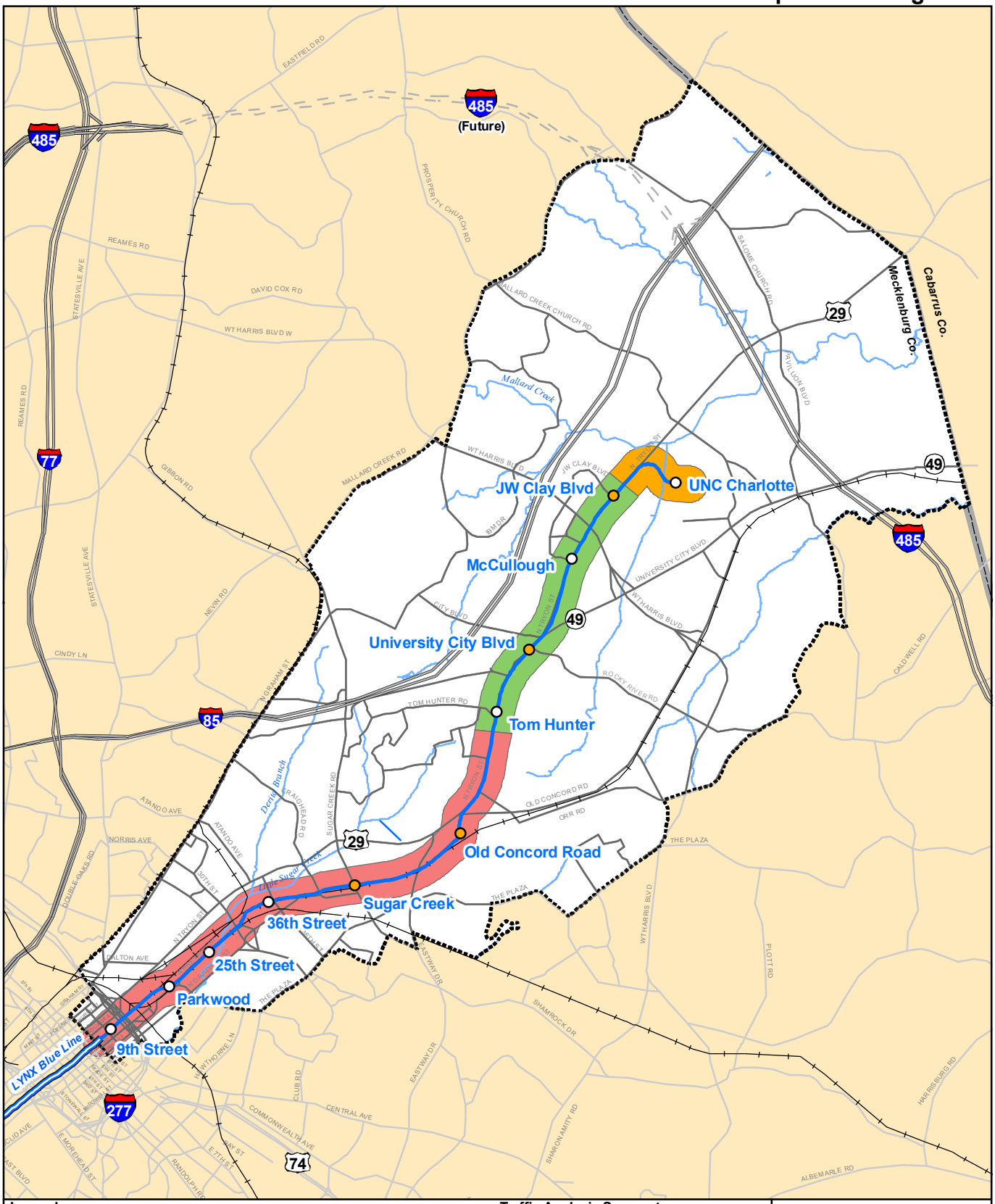
Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

07/08/11

BLE FEIS Figure 3-4.pdf

LYNX Blue Line Extension

Figure 3-5
Overall Corridor with Transportation Segments



Legend

- Northeast Corridor Limits
- Proposed Light Rail Alternative
- LYNX Blue Line
- Proposed Stations
- Proposed Stations with Park-and-Ride
- Railroads
- Highway
- Major Roads
- Highway (Future)
- Streams
- County Line

Traffic Analysis Segments

- Segment 1 (Center City to Owen Blvd)
- Segment 2 (Owen Blvd to Barton Creek)
- Segment 3 (Barton Creek to I-485)

N

0 0.5 1
Mile

Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

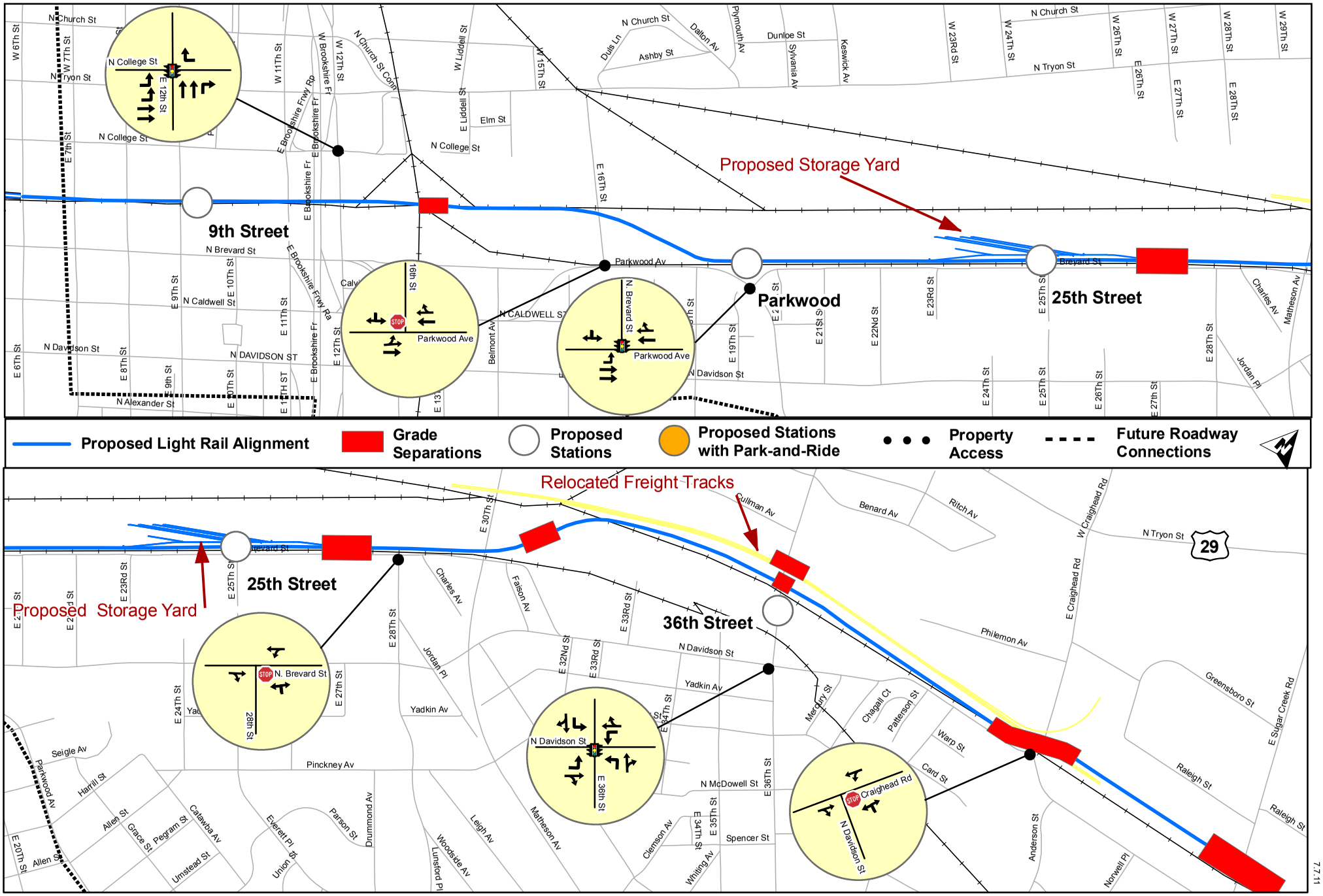
07/11/11

BLE FBS Figure 3-5

LYNX Blue Line Extension

Figure 3-6a

Grade Crossings - 2030 Preferred Alternative



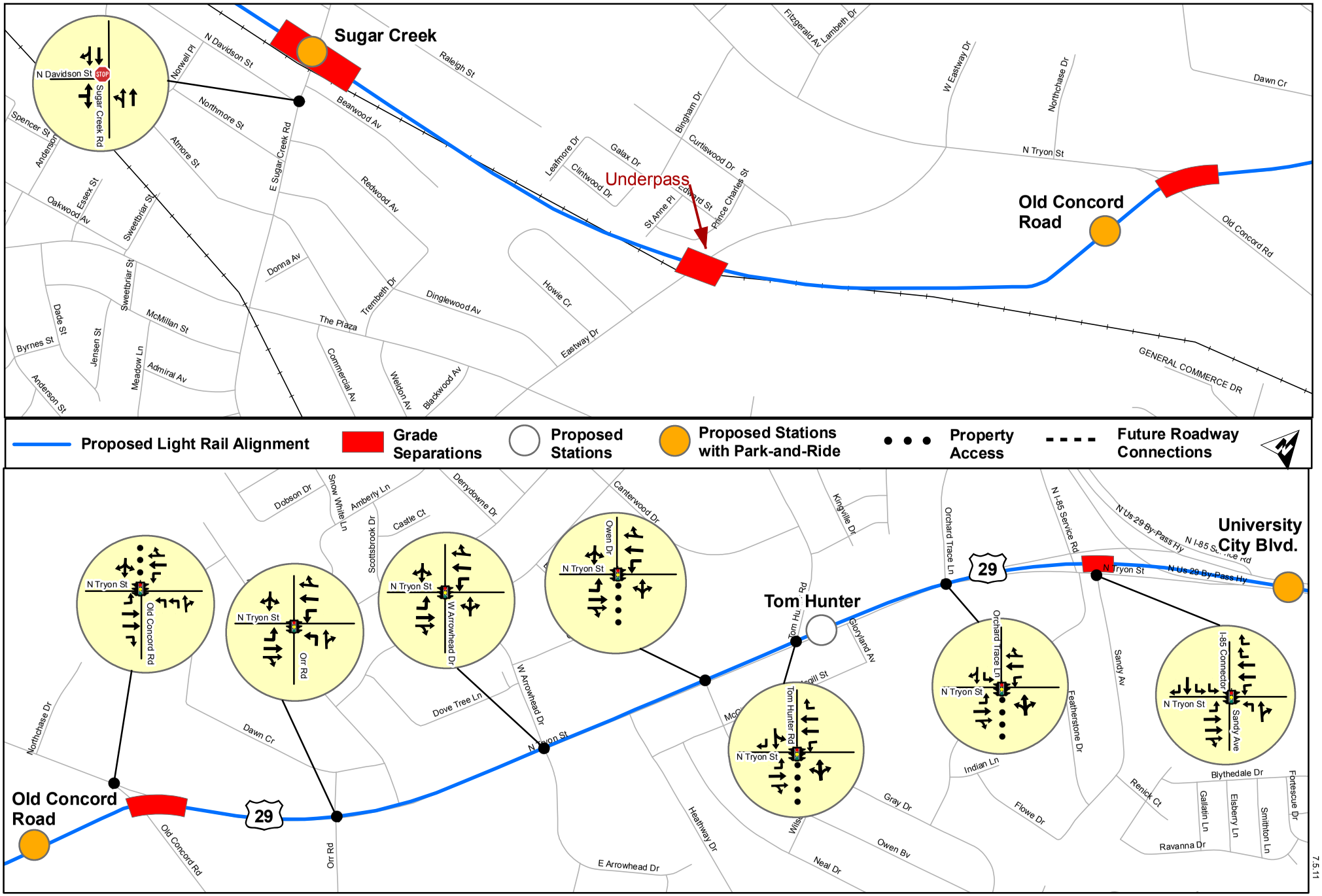
BLE FEIS Figure 3-6a.pdf

7.7.11

LYNX Blue Line Extension

Figure 3-6b

Grade Crossings - 2030 Preferred Alternative



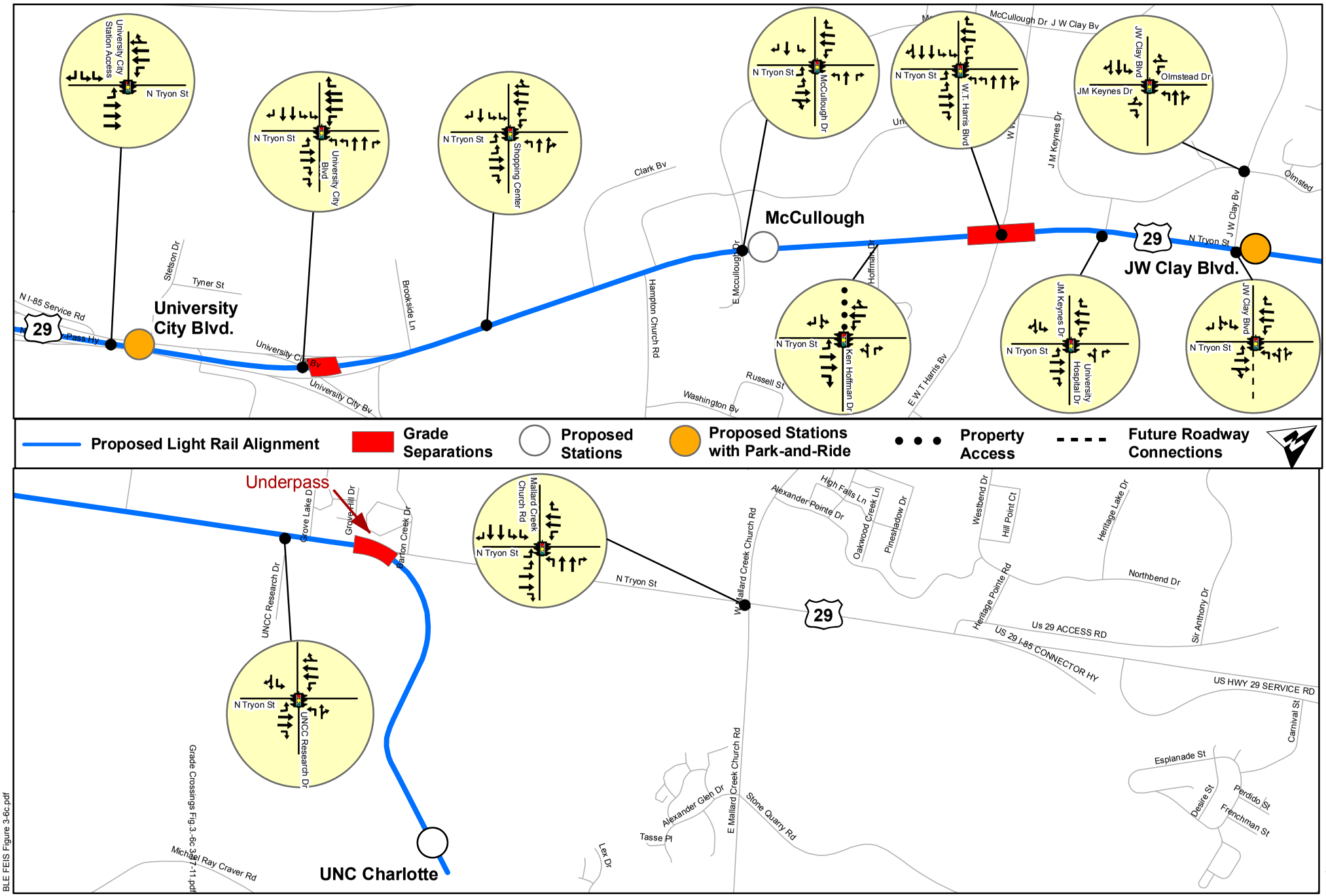
BLE FEIS Figure 3-6b.pdf

7.5.11

LYNX Blue Line Extension

Figure 3-6c

Grade Crossings - 2030 Preferred Alternative



BLE FEIS Figure 3-6c.pdf

Grade Crossings Fig.3-6c 3-11.pdf

7.5.11